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CEDAR SIDING SHELTER ARCHAEOLOGICAL EXCAVATION OF A MULTI-ASPECT OVERHANG EMERY COUNTY, UTAH

Prepared By

Curtis W. Martin
and
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Grand Junction, Colorado

EDITOR'S NOTE

Man has had a long history in Utah but of his very early occupation, the record is at best sketchy. This is particularly true of the Archaic forager period; so few sites are as yet known from which to add to the sparse current data. However, when a site, such as the Cedar Siding Shelter is located, its importance is double because it provides both geographic and chronological information.

Hence, it is with pleasure that we introduce Volume 15 in the Utah series of Cultural Resource Monographs, Cedar Siding Shelter: The Archaeological Excavation of a Multi-aspect Overhang in Emery County, Utah by Curtis W. Martin et al.

Besides dating its Archaic occupations to previously vacant time slots on the Colorado Plateau, the Shelter is in an area east of Price where no Archaic sites had been previously studied. The picture of Archaic food gathering practices thus generated fills in a blank spot in the ancient prehistorical landscape. Future research in the area will hopefully expand and further clarify this picture.

Finally, the Cedar Siding Shelter project illustrates that industrial related mitigation work can make important contributions to the culture history of Utah, if properly undertaken.

Richard E. Fike, Series Editor
Bruce Louthan

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The excavation of the multi-aspect Cedar Siding Shelter (42EM1533) in Emery County, Utah and the subsequent preparation of this report involved many people; the labors and support of these individuals are greatly appreciated.

The project was administered by Grand River Institute of Grand Junction, Colorado, under the direction of Carl E. Conner. Clifton Wignall served as Principal Investigator, Curtis Martin was Project Archaeologist.

Field work, under the direction of Martin, was accomplished by crew members Elaine Blackmer, Jim Conner, Sally Crum, Barbara Kutz, John Lindstrom, Anna Marie Rago, David Smyth, and Lester Wheeler. Assistance in artifact accessioning and analysis, flotation sample processing, and report preparation was provided by Sally Crum. Flotation and floral macrospecimen analyses and other environmental sections of the report were the responsibility of Lester Wheeler. Barbara Kutz, with the aid of Brian Hickman, conducted the tedious and nearly thankless job of debitage analysis. All maps and profiles were drawn by Harley Armstrong and Barbara Kutz; photography was conducted by Curtis Martin. Armstrong also analyzed the fossils, geological specimens, and raw lithic materials, and carried out the statistical analyses of the tools and debitage.

Elaine Anderson conducted the faunal analysis, Linda Scott, of Palynological Analysts, was responsible for the pollen study, and David Galinat analyzed the three corncobs. Beta Analytic, Inc. of Coral Gables, Florida, processed the radiocarbon samples. Jack Roadifer of the Geology Department at Mesa College kindly granted us access to the equipment necessary for conducting our soils analysis, which was carried out by Diana (Danni) Langdon and Sally Crum.

Substantive editing of the report was accomplished by Diana (Danni) Langdon. Elizabeth Rowan typed the manuscript and prepared the final charts and tables.

Finally, considerable assistance was lent by the people at the Moab District and Price Area Offices of the Bureau of Land Management, (especially Blaine Miller and Bruce Louthan), by Merritt Dismant at Intermountain Technical Services, Inc., and by various representatives of the Denver & Rio Grande Western Railroad for whom this report was prepared.

To all of the above and to any who have been inadvertently omitted, we extend our sincere thanks.

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INTRODUCTION

The Cedar Siding Shelter, recorded as archaeological property 42EM1533, is a prehistorically occupied rockshelter site located on Bureau of Land Management (BLM) lands in Emery County, Utah, approximately 40km southeast of Price. Originally identified during an intensive cultural resources inventory of a proposed 5.5-mile realignment of the Denver & Rio Grande Western Railroad (D&RGW) track conducted in May 1982, the site was determined likely to contain undisturbed stratified subsurface cultural deposits and was deemed potentially eligible to the National Register of Historic Places (Grand River Institute 1982a). To mitigate the probable direct, adverse effects of the proposed construction on the site, a data recovery (treatment) plan was prepared by Grand River Institute and submitted to the Advisory Council and the BLM (Grand River Institute 1982b). Upon the agencies' approval of the plan, Project Archaeologist Curtis W. Martin and crew returned to the site in July and conducted a 3-week-long testing program to assess the nature and extent of subsurface cultural deposits. Testing revealed several in situ features, several diagnostic artifacts, and undisturbed cultural deposits at as much as one meter deep, thus indicating the indispensibility of a full excavation. Such began on 16 August 1982 and continued through 2 October when it was determined that further investigations at the site would not yield significant new data except in certain proveniences where excavation was not feasible.

The excavation of the Cedar Siding Shelter was undertaken by Grand River Institute at the request of the D&RGW (represented by Intermountain Technical Services, Inc., 1360 Motor Street, Grand Junction, Colorado 81501) for compliance with the National Historic Preservation Act of 1966 (Section 106), Executive Order 11593, the Archaeological and Historic Preservation Act of 1974, the Archaeological Resources Protection Act of 1979, and other legislation governing the protection of National Register sites on federally owned lands. The goals of the project centered on the mitigation of the adverse effects of the proposed track realignment through a controlled program of data recovery, the laboratory analysis of collected cultural materials, and the interpretation of findings in report format.

The study was conducted under Utah BLM Antiquities Permit No. 82-UT-171 (expiration date 8 April 1983), held by Grand River Institute, under the direction of the Price Area Office of the Bureau of Land Management. Field notes and artifacts relating to the excavation will be housed in the curation facility of Mesa College, Grand Junction, Colorado.

ENVIRONMENTAL OVERVIEW

Cedar Siding Shelter is located in east-central Utah within the drainage of the Price River, a tributary of the Green River (see Figure 1). The site's location is described as: Township 16 South, Range 13 East, Section 28, NE¼NW¼SW¼, S.L.P.M. (UTM: 12; 545730mE; 4361170mN). Its name derives from the nearby D&RGW railroad siding known as the Cedar Siding.

The site comprises a large, flat slump block of Dakota sandstone and an adjacent overhang situated amid barren, rock-strewn hills at the head of a small, ephemeral, southwest-flowing drainage (see Plate 1). Elevation is 5140' (1567m). The surrounding terrain is characterized by shallow to deep canyons and rolling shale lowlands. Slopes in the area are moderate to steep and are generally to the south and southwest, toward the Price River. The dominant topographic feature of the landscape is the Book Cliffs escarpment 10-11km northeast of the site.

The site lies approximately 300m east of Grassy Trail Creek and 4.3km north of the Price River. Although technically an intermittent, Grassy Trail Creek contains water much of the year, and even when surface flow ceases, there is still active ground water which forms numerous surface pools. Grassy Trail Creek heads in the Book Cliffs and flows west, then south to its confluence with the Price River approximately 1.6km southwest of the site.

Climatically, the area is characterized as a cold desert. Average annual temperature is 49-52°, average annual precipitation is 6-10". There is a frost-free growing season of 120-150 days (Wheeler and Langdon 1982:9-10).

Soils in the site vicinity are classified as being of the Bributte-Badland-BG Complex and are generally well-drained and exhibit slow to moderate permeability. Specifically at the site, the soil type is BG loam (Bureau of Land Management 1979). Locally these soils support a shrub grassland dotted with juniper. Saltbush, yellowbrush, squawberry, and sage are the most frequently occurring shrubs. Dominant among the grasses are dropseed, Indian ricegrass, galleta, bluegrass, and cheat.

Moving away from the specific site area, vegetation types become more diversified. At a distance of approximately 3km from (northeast of) the site are areas of pinyon-juniper growth; these extend into the Book Cliffs, 10-11km away. Along drainages, riparian communities prevail. The Price River supports a well-developed habitat with cottonwood woodlands and a variety of shrubs. Along Grassy Trail Creek, scattered cottonwoods and riparian shrubs grow adjacent to the streambed. An unnamed spring-fed intermittent east of the site supports the limited growth of tamarisk and sedges. These riparian communities are a valuable resource--the diverse flora result in wildlife use of the area that is disproportionately higher than that of surrounding areas. Appendix A provides a list of vegetation species occurring in and around the site area.

Faunal inhabitants are typically those of an arid environment. Antelope are common. Mule deer use of the area varies from a few year-round inhabitants to large populations that migrate in response to seasonal changes. Predators

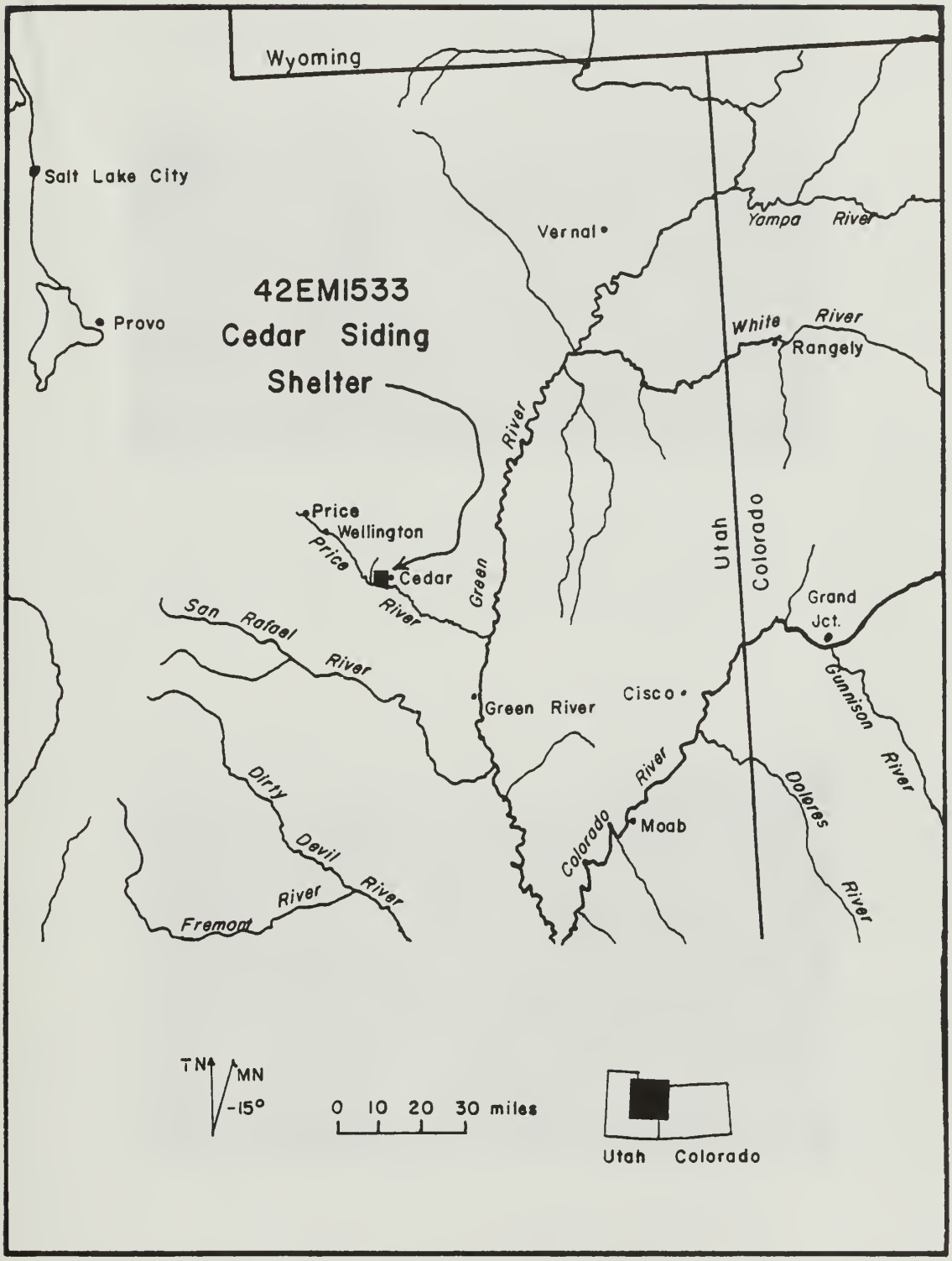


Figure 1. Map of northeastern Utah, showing location of site 42EM1533, the Cedar Siding Shelter.

a. View of the Cedar Siding Shelter Site looking east. Locus I lies below the canyon rim to the left, Locus II lies atop the rim. Note Cedar Rock near the center of the photograph, the Osmond Overhang directly behind, and the Book Cliffs in the distance.

b. View of Cedar Rock, looking southwest from atop the Osmond Overhang directly into Overhang B. Figure on left (beside map table) stands at Datum. Note "Northeast Roof Fall Boulder" behind shaker screen.

PLATE 1

such as the coyote and bobcat are present, especially near riparian communities; toward the Book Cliffs, the mountain lion is common. Small mammals include the cottontail, jackrabbit, woodrat, squirrel, and white-footed mouse. Among the raptors known in the area are the bald eagle, golden eagle, red-tailed hawk, and various owls. Lizards and snakes are abundant. Appendix A provides a list of wildlife species known in and around the site area.

Although paleoenvironmental data from eastern Utah is scant, it is generally agreed that climatic conditions have remained fairly constant over the last 12,000 years and that any shifts in effective moisture and temperature have not been of a magnitude great enough to alter the area's classification as a desert or steppe (J. Jennings 1978:12, 15). Therefore, while fluctuations in the availability of local resources may have occurred in response to minor climatic changes over time, the floral and faunal species present in prehistoric times are assumed to have been essentially those available in the area today.

Within a radius of 10km of Cedar Siding Shelter, the area defined by Roper (1979:121) as being the maximum area profitably exploitable by aboriginal hunters and gatherers (i.e., the site's catchment), three vegetation communities occur--the pinyon-juniper, the desert shrub, and the riparian. The pinyon was valued for its nuts, pitch, and use as a fuel, while the juniper provided berries for food, decoration and medicine, and bark for use in bedding, clothing, etc. (Elmore 1976:15; Moore 1979:93). Shrubs such as saltbush (Atriplex) and squawbush (Rhus) yield edible seeds and berries; squawbush and yucca were useful in basketmaking; yucca can also be used as soap (Elmore 1976:37-43); Harrington 1972:59). Prickly pear fruits and pads provide both food and moisture. Edible bulbs are produced by the sego lily and wild onion (Harrington 1972:17). Mustards such as bladderpod and pepperweed yield early edible shoots and later produce edible seeds. The prehistoric harvest of various grasses--dropseed, Indian ricegrass, and wildrye--as well as goosefoot (Chenopodium), pigweed (Amaranthus), and sunflower (Helianthus) is well documented in the ethno-botanical record (Jennings 1980:222; Jennings et al. 1980:187). The riparian communities within the site catchment--those along the Price River, Grassy Trail Creek, and several small springs--not only offer diverse floral resources including cottonwood, tamarisk, willow, phreatophytic shrubs, sedges, rushes, cattails, reed grass, and arrowroot, but also provide habitat for mammals and birds.

Generally, the seasonal availability of most species present in this area is confined to the period from early spring through early fall. Annuals and various members of the Cruciferae and Graminae families provide seeds, roots, and fresh shoots as early as April and May. As the growing season progresses, perennial species, especially the prodigious seed producers of the Graminae family, begin to bear fruit. The majority of seed producers, such as Oryzopsis, Cactaceae, and the chenoams, are available during the period from March through June. Several shrub species such as Atriplex and Rhus also produce seeds at this time. The pinyon nut is available in late summer and early fall.

An ethnographic study of the Paiute living in Surprise Valley in northeastern California (Great Basin) may be helpful in formulating a possible seasonal use pattern of Cedar Siding Shelter (Aikens 1978:71). During the winter months, 20-30 families would join together and occupy camps in pinyon forests. During

this time they participated in rabbit and antelope drives, the cooperation of many people being required for a successful drive. In early spring, the winter camp was abandoned and the families separated in order to maximize the potential for gathering plant foods, descending to harvest the new shoots and greens of lower elevations. As the days grew warmer, the Paiute followed the growing season up to higher and cooler country where plant foods ripened later. In the fall they returned to the pinyon forests.

It is possible that the inhabitants of Cedar Siding Shelter were following a similar seasonal round. However, the year-round availability of water and the diversity of local vegetation communities may have obviated such seasonal migration except during the hottest months or for the procurement of select resources.

SITE DESCRIPTION

The site consists of a series of five rockshelters (Overhangs A through E) formed at the periphery of a large, flat slump block of Dakota Sandstone, a separate overhang carved beneath the sandstone caprock (the Osmond Overhang), and an associated open lithic scatter which extends primarily to the north and northwest. The site area below the rim of the canyon, including all the overhangs, has been designated Locus I (where 458 artifacts were located on the surface of the site). The area above the rim constitutes Locus II. While Locus II encompasses roughly two-thirds of the total 7.5 acre site area, less than one percent of all artifacts (surface and subsurface) were located here. (See Figures 2 and 3).

The slump block, or "Cedar Rock", measures 19m in diameter and lies on a boulder-strewn bench approximately 20m south of the canyon rim. Erosion of the underside of the slump block has formed a shallow overhang extending around 280° of the 360° perimeter of the boulder, and having aspects in all cardinal directions except south (see Plate 1b). The majority of the cultural remains recovered during the Cedar Rock excavations were located in the sheltered area facing from true north eastward to south-southeast (an arc of 155°). The exact reasons for this are not known, but the eastern and northeastern overhangs do provide excellent shelter and contain the deepest and least-washed soils. It is quite possible that the other suitable overhangs at the northwest edge of the boulder (Overhangs A and E) were occupied as frequently but that cultural materials here have been sheet washed, mixed, and scattered since deposition, thus leaving fewer remains to be found.

Overhang A is situated on the northern side of Cedar Rock, faces due north, and measures 5m long (east-west), up to 2.9m deep, and 1.2m high (see Figure 4). The eastern half of the overhang's shallow sandy fill was excavated and screened. The maximum depth of the fill was 12cm. No artifactual materials were recovered. The western half of Overhang A remains unexcavated.

Grid Square 17N27W was excavated immediately beyond the mouth of Overhang A. Pale brown loamy sand continued to a maximum depth of 30cm where sandstone bedrock was contacted. A few chert flakes were found in the upper 20cm of fill.

Overhang B, facing to the north and northeast, lies immediately to the east of Overhang A; the two shelters are divided by an exposure of sandstone bedrock. Overhang B measures 6m long (east-west), 3m deep, and from 0.9m high in the back to 2.5m high at the mouth (before removal of the cultural fill) (see Plate 2). At the time of aboriginal occupation, the overhanging roof of this shelter (as well as the northern end of Overhang C) extended eastward as much as 3 additional meters; a large portion of the roof, referred to as the "Northeast Roof Fall Boulder", collapsed at some time in the recent past and now lies atop the cultural fill in this location.

The cultural fill extended from the present ground surface to the bedrock floor of Overhang B, at a maximum depth of 101cm. The fill was generally an unstratified unit of wind- and water-deposited loamy sand mixed with

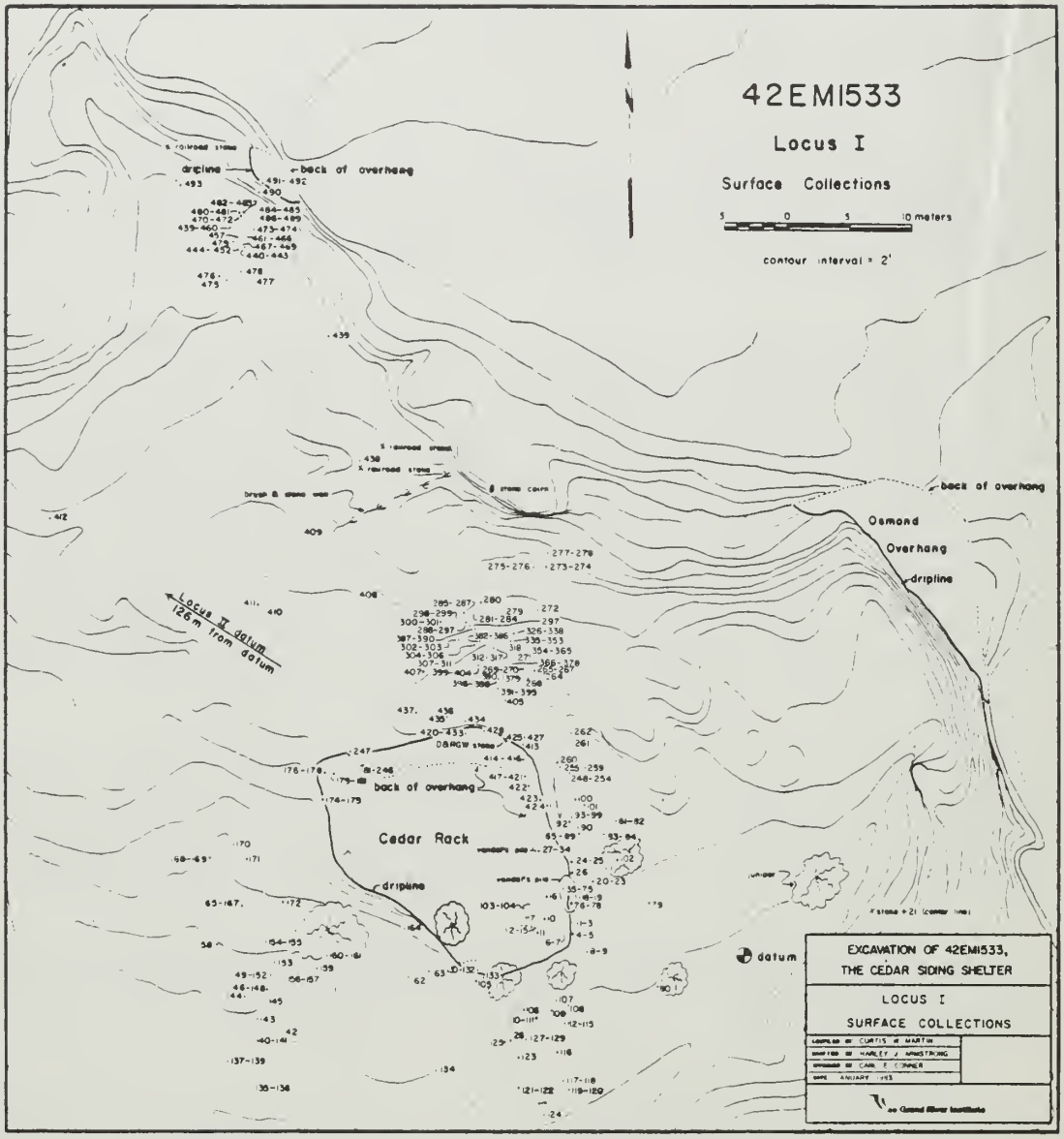


Figure 2. Plan view of Cedar Siding Shelter Site, Locus I, showing distribution of surface artifacts.

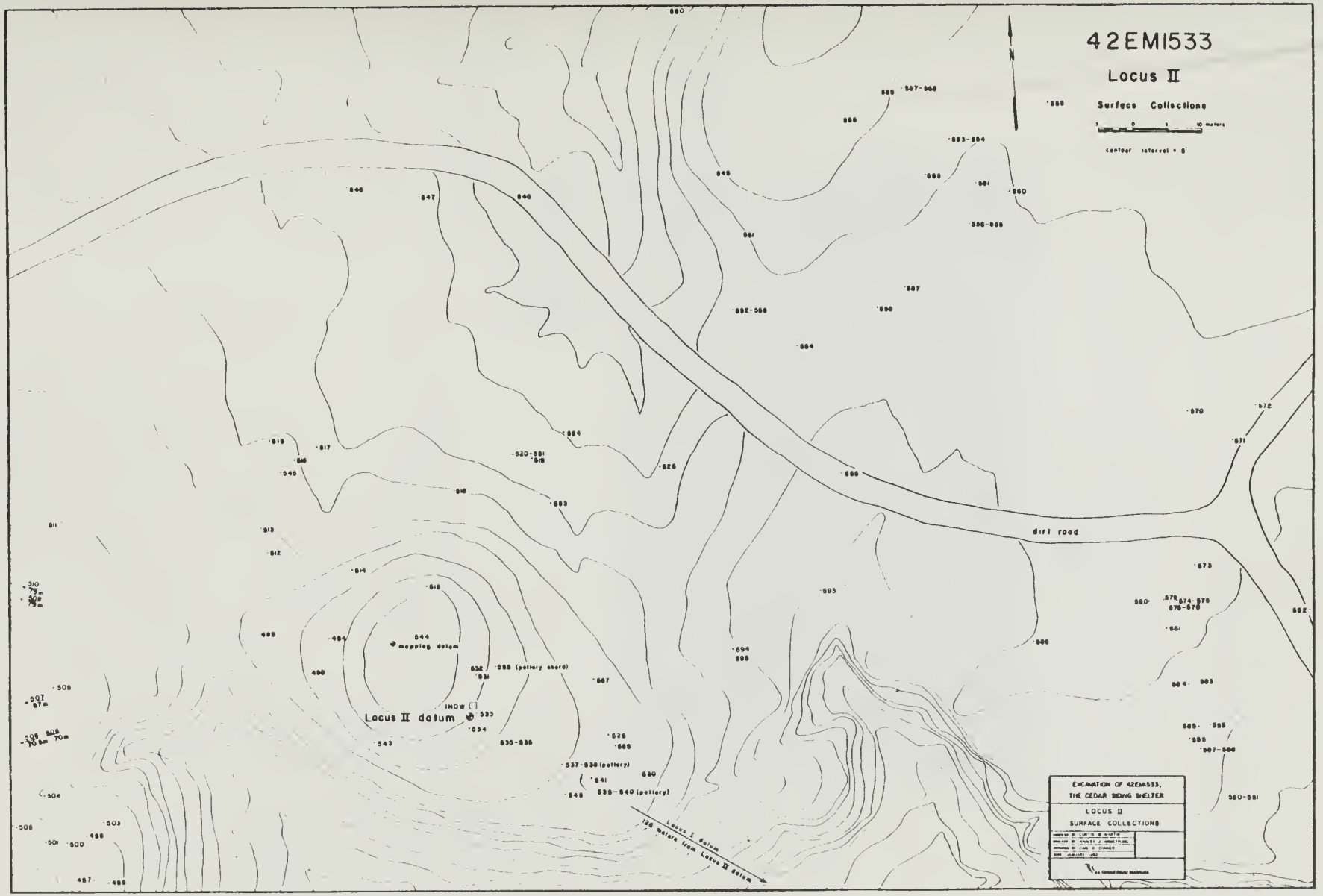


Figure 3. Plan view of Cedar Siding Shelter Site, Locus II, showing distribution of surface artifacts.

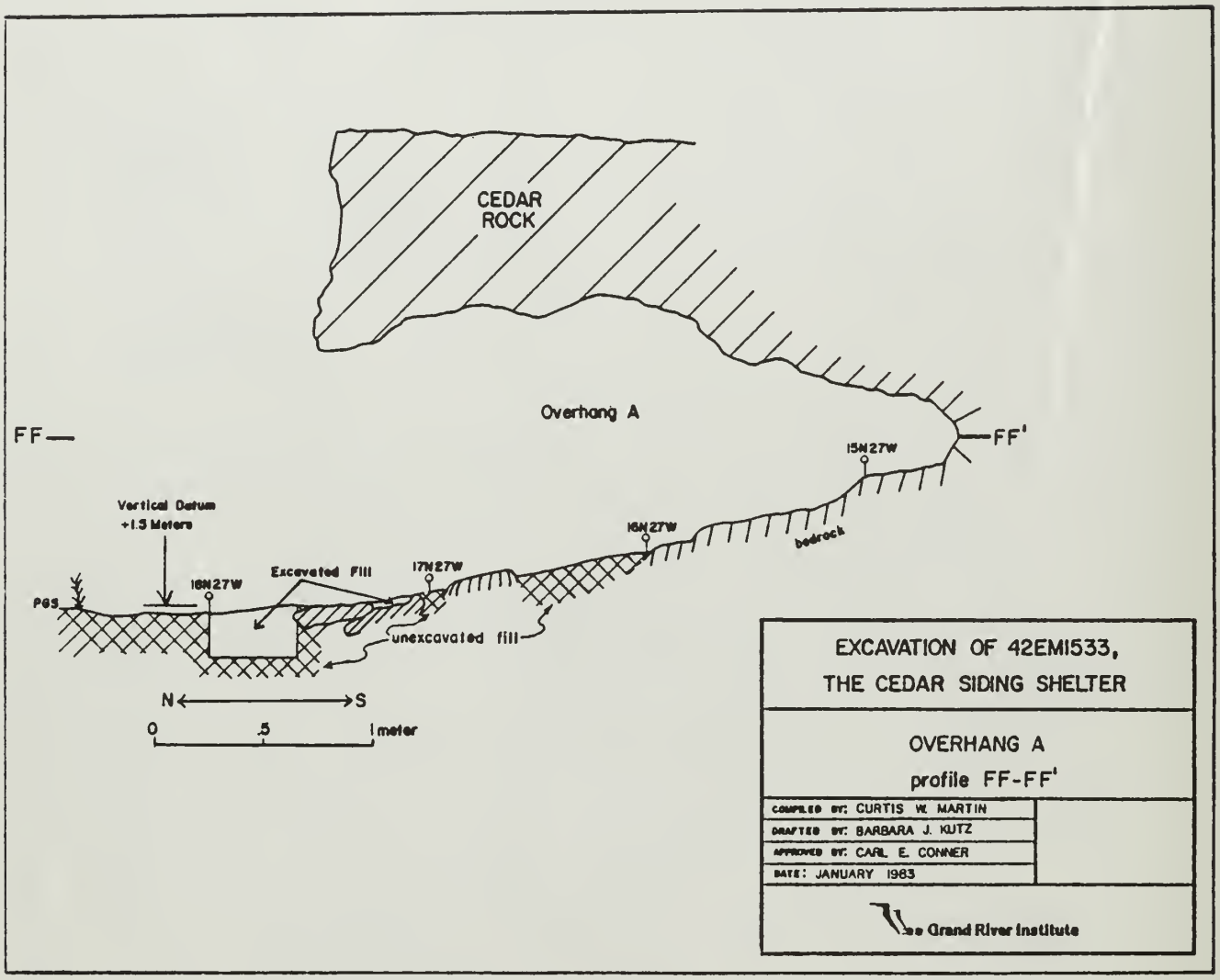


Figure 4. Profile of Overhang A.

View of Overhang B, partially excavated, looking southwest.

PLATE 2

ash and charcoal (see section entitled Stratigraphy). Six fire hearths of various descriptions and a juniper bark mat were recorded in Overhang B, and over 7,000 artifacts (nearly half of those recovered from Cedar Siding) were collected here--primarily lithic debitage. The area also yielded a significant number of large biface tips, suggesting a workshop of some sort, perhaps butchering or wood-working (see section entitled Artifact Analysis). A high percentage of the groundstone tools was also recovered here.

Directly south of Overhang B, occupying the entire eastern side of Cedar Rock, is Overhang C. The northern half of this provenience has been called "The Hallway", consisting of a narrow passageway between the back wall of the shelter and a series of large boulders to the outside. The Hallway measures 7m in length (from Overhang B south to where Overhang C widens at the southeastern corner of Cedar Rock), as much as 3.1m in width at the north end (probably somewhat wider before the partial collapse of the roof), and from 90cm to 3m in height prior to excavation (see Figures 5 and 6 and Plates 3a and b).

The cultural fill at the north end of The Hallway was similar to that in Overhang B--somewhat stratified ashy loamy sand up to 76cm deep, resting on a floor of sandstone bedrock. The remainder of the fill in this shelter was loose, primarily wind-deposited, and shallower (40cm deep at the south end).

A cluster of seven hearths and possible hearths was located near the north end of The Hallway. Several of these were situated beneath the Northeast Roof Fall Boulder, where, undoubtedly, others remain unexcavated . Feature 19, a large, slab-lined storage cist, was found at the south end of the shelter. More than 4,400 flakes and tools were recovered here.

The remainder of Overhang C, situated at the southeast corner of Cedar Rock, became known merely as the "South End". Facing east and southeast, this shelter measures 7.4m long (north-south), up to 4.6m deep, and from 40cm high at the back to over 3.5m at the mouth (see Figure 7 and Plates 4a and b).

The loose, dusty fill of the South End ranged in depth from 20cm at the south to 80cm at the north and rested upon a layer of jumbled sandstone roof fall. A small hole measuring approximately 75cm in diameter and 50cm deep had been dug into the center of this overhang by souvenir hunters prior to our excavation.

Seven hearths, a small grass mat (probably from a rodent nest), and a slab-lined cist were uncovered in this shelter. Over 2,300 artifacts were collected. Also recorded were two zoomorphic pictographs (apparently representing bighorn sheep) painted in red pigment on the back wall of the South End.

Overhang D, which faces southwest, measures 5.8m long (northwest-southeast) and 1.5m deep and is somewhat sheltered by a high, sloping ceiling. The "fill" resting atop the sandstone floor of this shelter consists of up to 2cm of sand and pebbles. No excavations were conducted at this location and no artifacts were recovered.

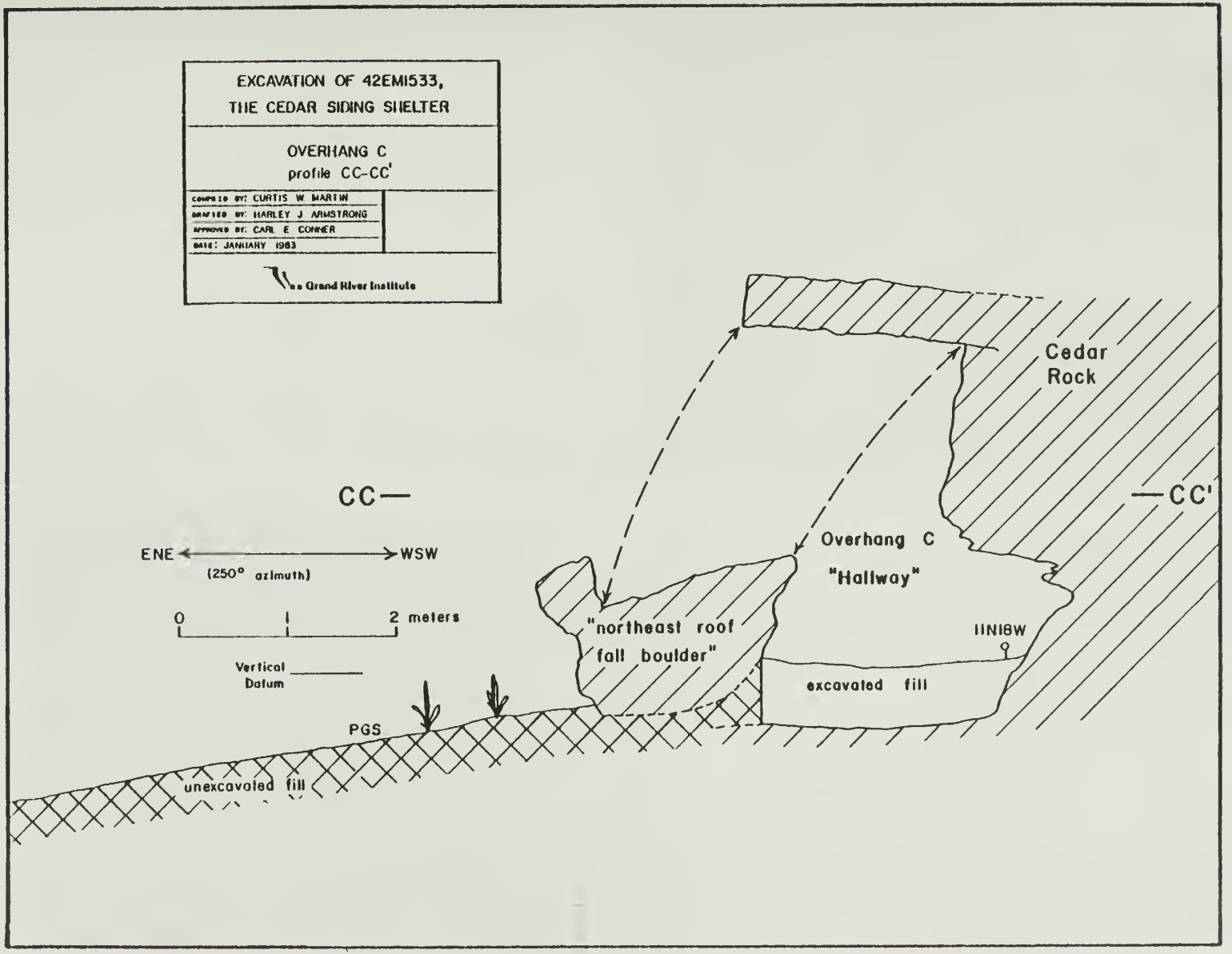


Figure 5. Profile of Overhang C, Hallway, showing the "Northeast Roof Fall Boulder" beneath Overhangs B and C.

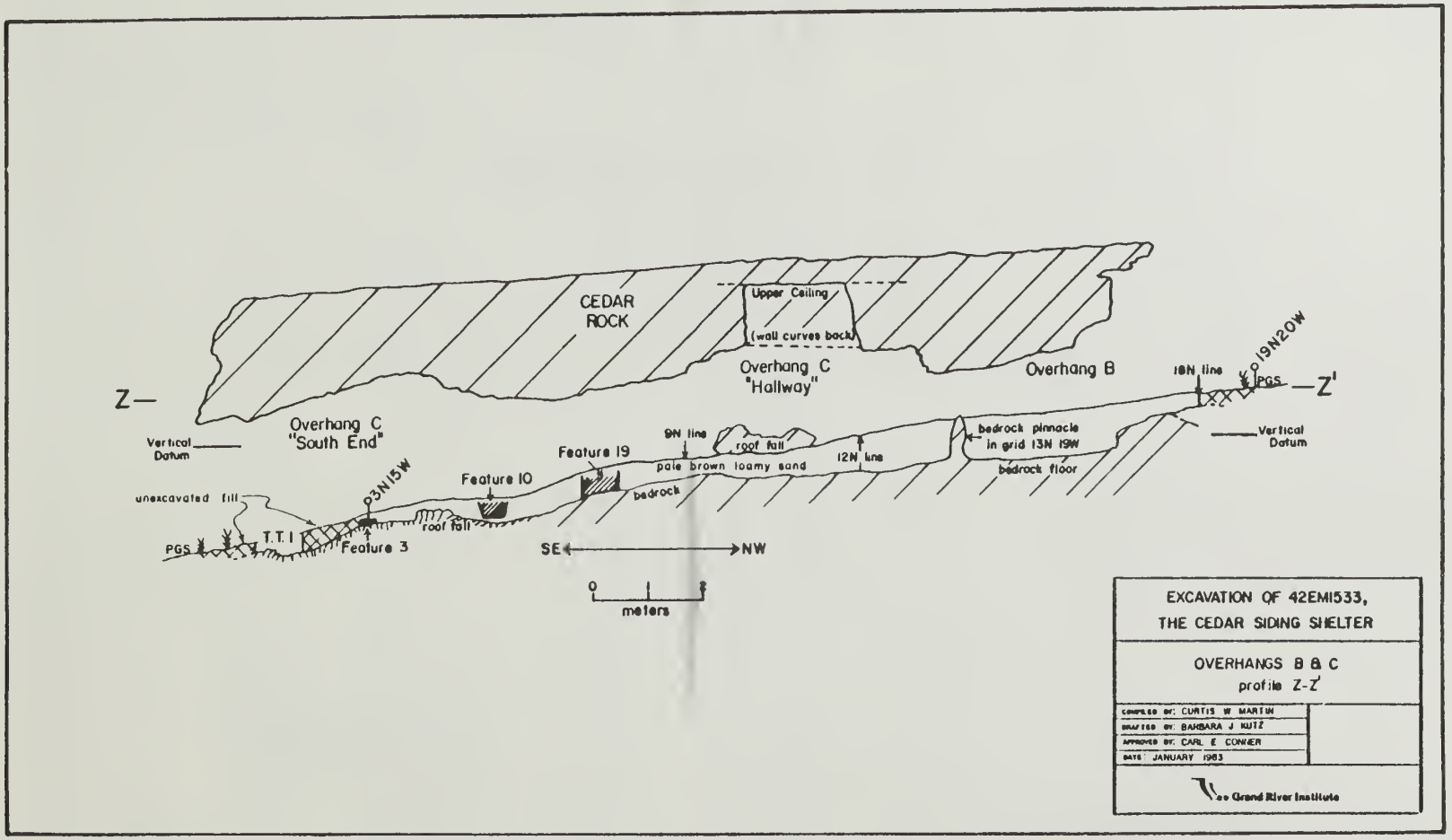


Figure 6. Profile Z-Z', through Overhangs B and C.

a. Overhang C "Hallway", prior to removal of cultural fill, looking south-southeast. Figure stands in "South End". Note "Northeast Roof Fall Boulder" on left.

b. Overhang C, "Hallway", after completion of excavation, looking south-southeast. Figure stands in "Hallway".

PLATE 3

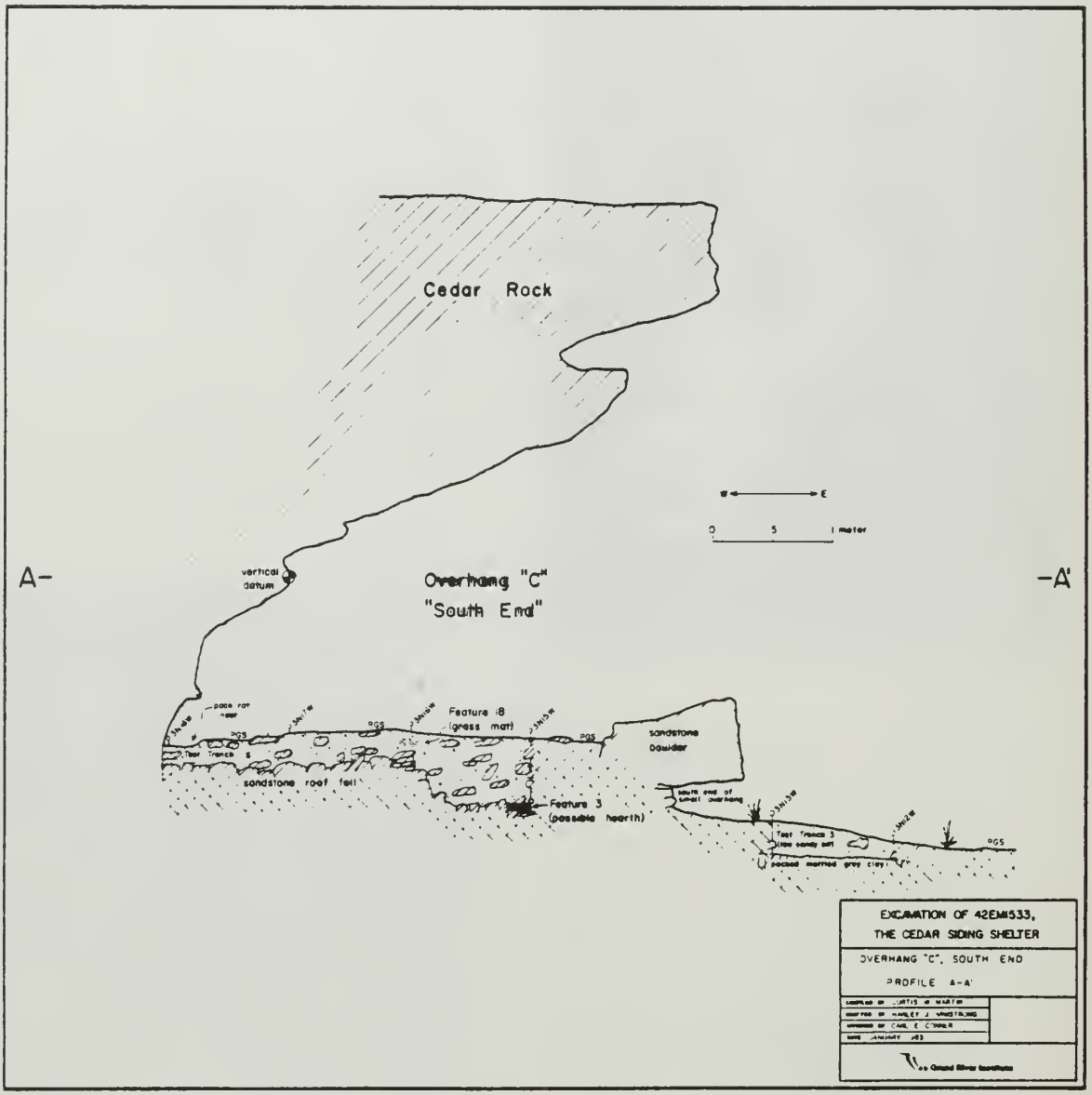


Figure 7. Profile of Overhang C, "South End."

a. Looking north at Overhang C, "South End", prior to excavation. Trowel to right of North arrow lies in small vandal's pit (center of photograph).

b. Looking southwest at Overhang C, "South End", during excavation. Note Test Trenches 2 and 3 outside overhang to left.

PLATE 4

Overhang E, immediately north of Overhang D and west of Overhang A, is the last of the series of five shelters located around Cedar Rock. A west-facing shelter, Overhang E measures 7.8m long (north-south), 3.8m wide, and up to 1.9m high. The floor of this overhang consists of a sandstone shelf approximately 35cm high. Resting on this shelf was a pocket of water-deposited, pale brown loamy sand (up to 18cm thick) which contained over 700 artifactual lithics (see Figure 8).

Grid Unit 13N33W was excavated below the sandstone ledge at the mouth of Overhang E. The fill in this square consisted of pale brown loamy sand to a depth of 20cm where hard-packed pebbly clay was contacted. Thirteen artifactual flakes were collected in the upper 12cm of this grid.

The Osmond Overhang, located 32m northeast of Cedar Rock, was created by the undercutting of the Dakota Sandstone rimrock. This overhang faces southwest and measures 22m long, 7.5m deep, and approximately 90cm above present ground surface (pgs) (see Figures 9, 10, and 11). A single culture-bearing unit, Cultural Level I, was located at 76 to 83cm below pgs. Two fire zones were recorded and 24 artifactual lithics were collected during the excavation of 5 trenches (see Plate 5).

Five additional one-meter square grid units were excavated to determine the nature and extent of subsurface cultural remains outside the overhangs. In the open area directly south of Cedar Rock, where no surface lithics were located, Grids 4S26W and 13S26W were opened. The fill in both pits consisted of artifactually sterile, water-deposited silts, sands, and gravels.

Unit 56N40W was excavated in the area of a surface flake scatter below a small overhang on the canyon rim to the north of Cedar Rock. This grid also produced sterile gravels and sands.

In order to test the extent of the cultural deposits at the mouth of Overhang B, at the outer edge of the Northeast Roof Fall Boulder, Grid 14N15W (referred to in the field as "Test Trench 9") was opened and cleared well into the sterile gray clay layer (the total depth excavated was 64cm). Thirteen flakes were recovered from the upper sandy loam layer, which ranged to 25cm in thickness.

The final excavation was conducted at Grid Unit II-1N0W in Locus II above the canyon rim where several ceramic sherds had been found on the surface. Three artifactual flakes were located in the upper 10cm of brown, pebbly, loamy sand. Below this was a layer of sterile gray clay which continued to the total excavated depth of 25cm.

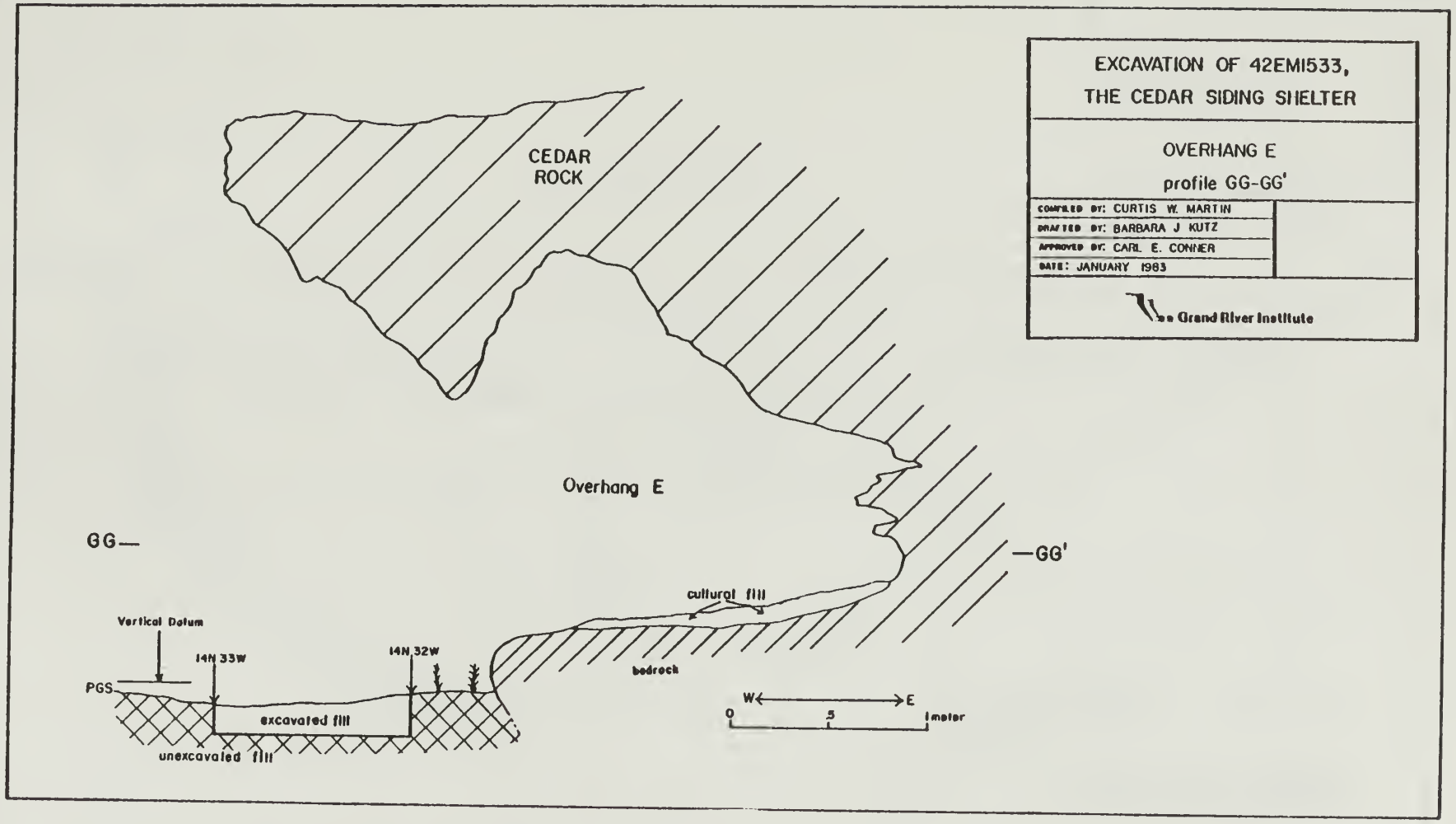


Figure 8. Profile of Overhang E.

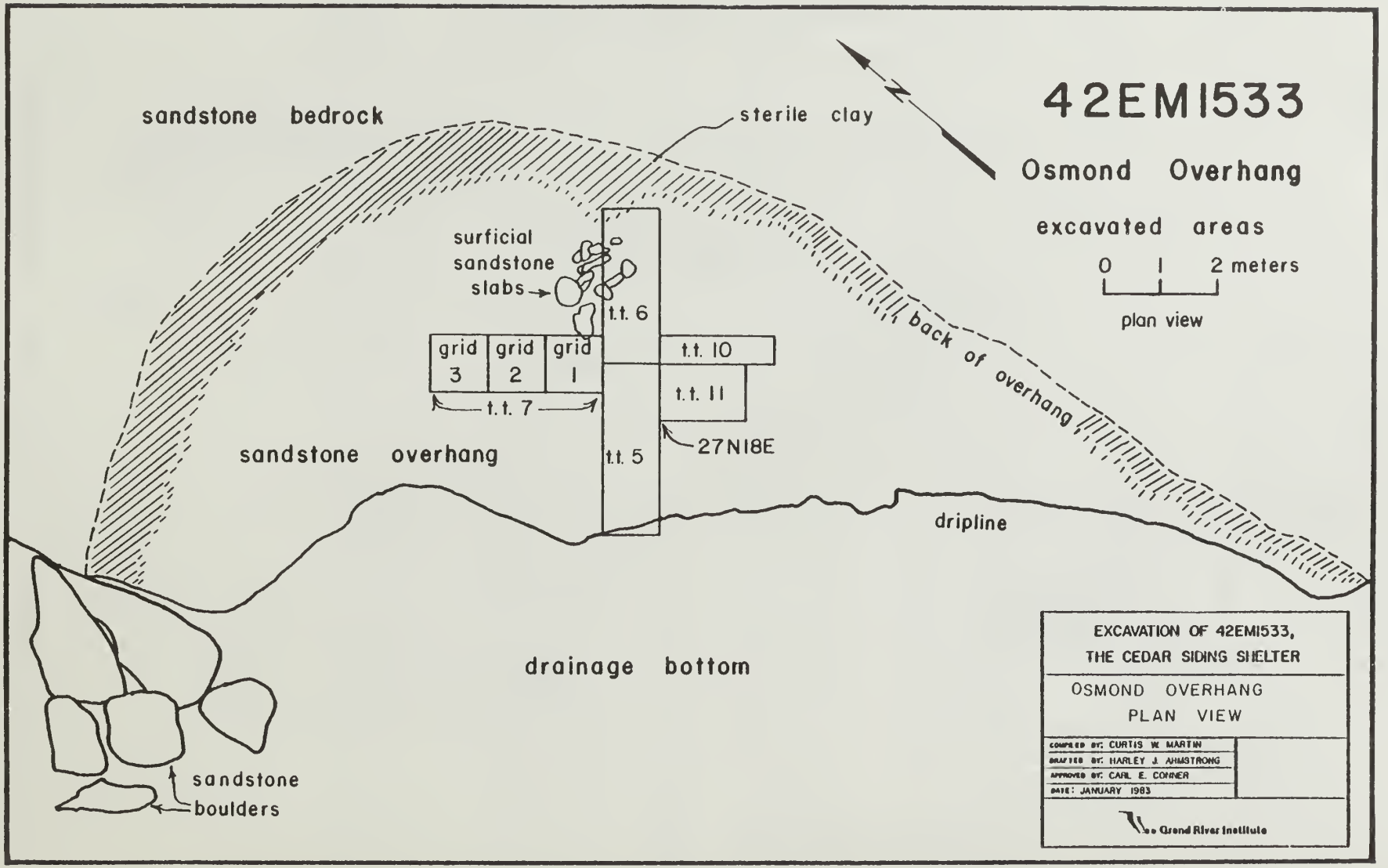


Figure 9. Plan view of the Osmond Overhang.

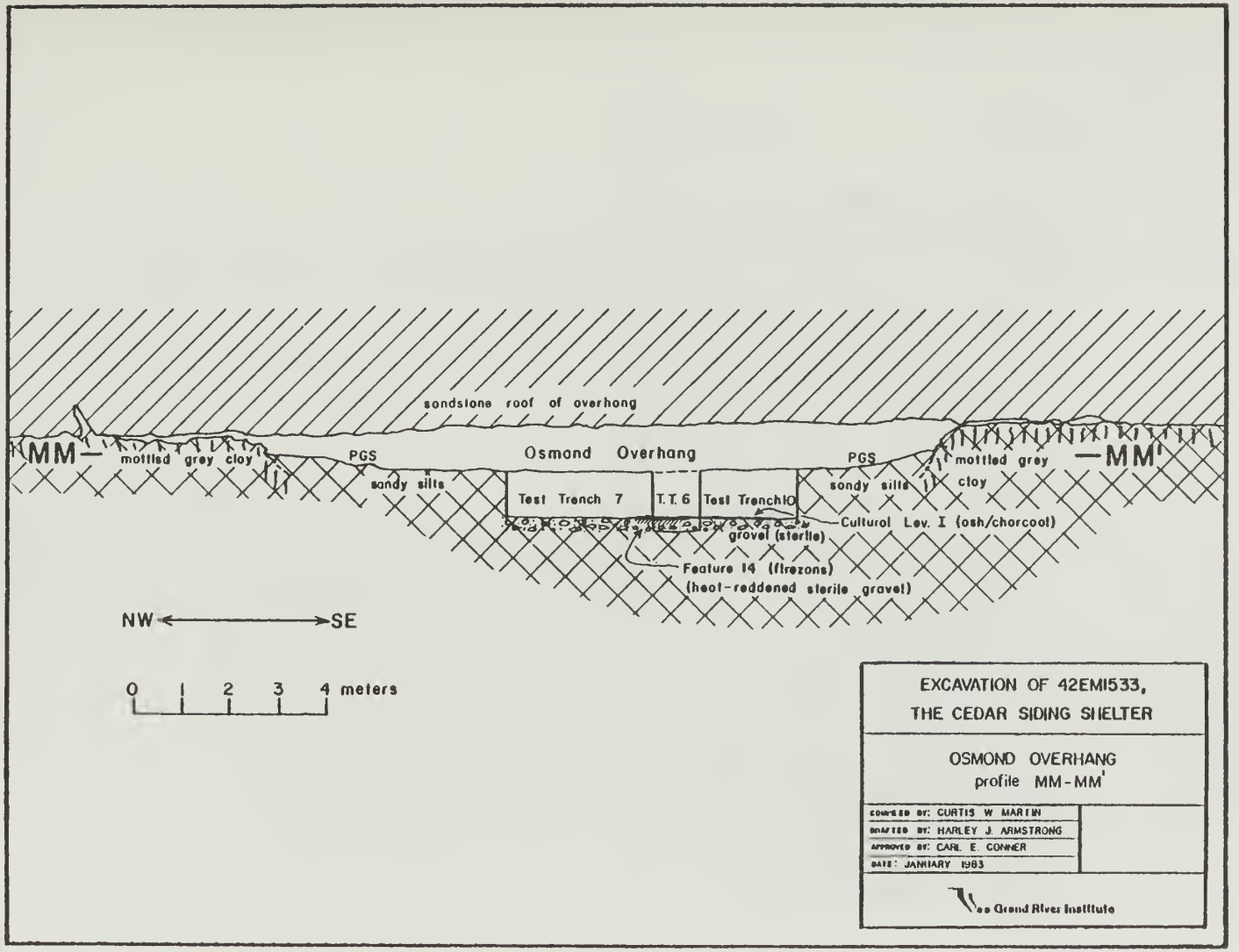


Figure 10. Profile MM-MM', Osmond Overhang.

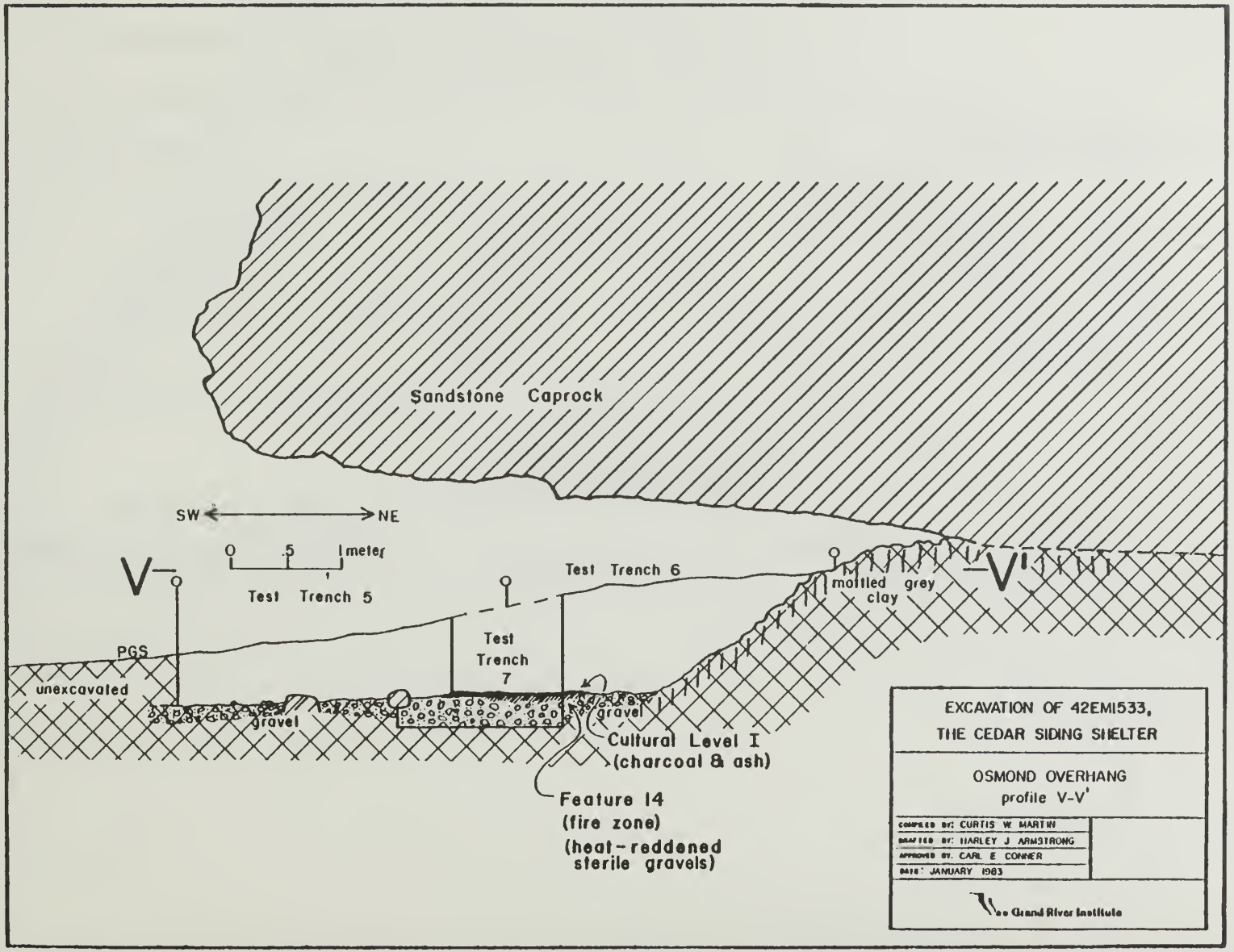


Figure 11. Profile V-V', Osmond Overhang.

Looking north into the Osmond Overhang after excavation of Test Trenches 5, 6, and 7.

PLATE 5

RESEARCH CONSIDERATIONS

Upon discovery, the major portion of Cedar Siding Shelter remained undisturbed and intact. It was apparent that up to a meter of dry fill was present in some portions of the overhangs and that the site retained at least a significant portion of its locational integrity. It was hoped that stratified cultural deposits, perishable artifacts, environmental and dietary information, and datable charcoal remained in situ in the subsurface fill.

Research questions to be addressed during the investigations at the site, should the cultural deposits and data retrieval allow, included the following (as presented in Grand River Institute's data recovery plan [1982b] and as recommended by the Advisory Council):

1. Is there evidence of cultural and temporal continuity between the Late Archaic and Fremont occupations at the site?
2. What was the subsistence of the site's occupants and from what area were resources derived?
3. Was occupation seasonal or year-round and what are the environmental determinants in the site's catchment?
4. Are there subsurface cultural deposits in areas of the site which do not exhibit surficial evidence of occupation?
5. What social unit(s) occupied the rockshelters; what were the spatial use patterns within the shelters; what environmental or other factors influenced the location of certain types of activities or occupation areas; and what functional and spatial use patterns were consistent over long periods of time?
6. Are there any other free-standing, multi-aspect rockshelters known; have they been archaeologically investigated; and how does Cedar Siding Shelter compare/contrast?

These questions, as well as those basic to all archaeological research, will be addressed in the sections of the report which follow.

EXCAVATION PROCEDURES

The first phase of the mitigation at Cedar Siding Shelter was a 100% collection of the surface artifacts. The locations of all surface specimens were marked with pin flags and a mapping datum was established 15m to the east of Overhang C, South End. Using enlargements of the 2-foot contour interval map supplied by Intermountain Technical Services, Inc., a plane table, transit, and metric tape, the location of each specimen in Locus I was plotted. Specimens were bagged separately, each with an identifying number corresponding to that on the plan map (see Figure 2).

This surface collection included the surface artifacts within the overhangs at Cedar Rock and two recent accumulations of flakes (marked as "vandal's piles" on the map). There were no surface specimens within the Osmond Overhang.

A second arbitrary mapping datum was established on Locus II, a similar map was constructed (see Figure 3), and the artifacts were collected. On Locus II, a second arbitrary excavation datum was established and the sole 1-meter square test pit at Locus II (Unit 1N0W) was laid out and excavated.

Re-using the mapping datum on Locus I as the excavation datum, a Union grid system oriented on true north was constructed, and 1-meter grid squares were staked in the areas to be excavated. Occasionally, during the test excavation phase of the mitigation and at all times in the Osmond Overhand, 2- and 3-meter-long "test trenches" (numbered chronologically) were opened to expedite the removal of overburden and/or cultural fill. Otherwise, all excavation was carried out within individual 1-meter squares. Collected specimens were bagged separately according to grid unit and referenced by the coordinates of the southwest corner of that unit (see Figures 12 and 13).

Vertical control was maintained and referenced according to a permanent "Vertical Datum" which was incised at an arbitrary height on the sandstone wall directly above grid coordinate 3N17W. Although the elevations of all grid coordinates were calculated in reference to this datum (at present ground surface and at the base of the excavation), artifacts and bulk samples collected were all referenced relative to the present ground surface (pgs) at the highest corner of the grid square (or test trench).

Cultural fill was excavated by arbitrary 10cm levels except as noted below. It was hoped, at the inception of the project, that arbitrary units could soon be abandoned in favor of naturally occurring stratigraphic levels. Unfortunately, the fill beneath Cedar Rock proved to be unstratified except in two restricted areas--the western end of Overhang B and the northern end of The Hallway. In these two areas the fill was excavated using a system of arbitrary levels within the natural levels (see section entitled Stratigraphy). Also, during the early testing of the site and again at the very end of the project, several grid squares and Test Trench 2 were excavated according to 20cm, or larger, levels.

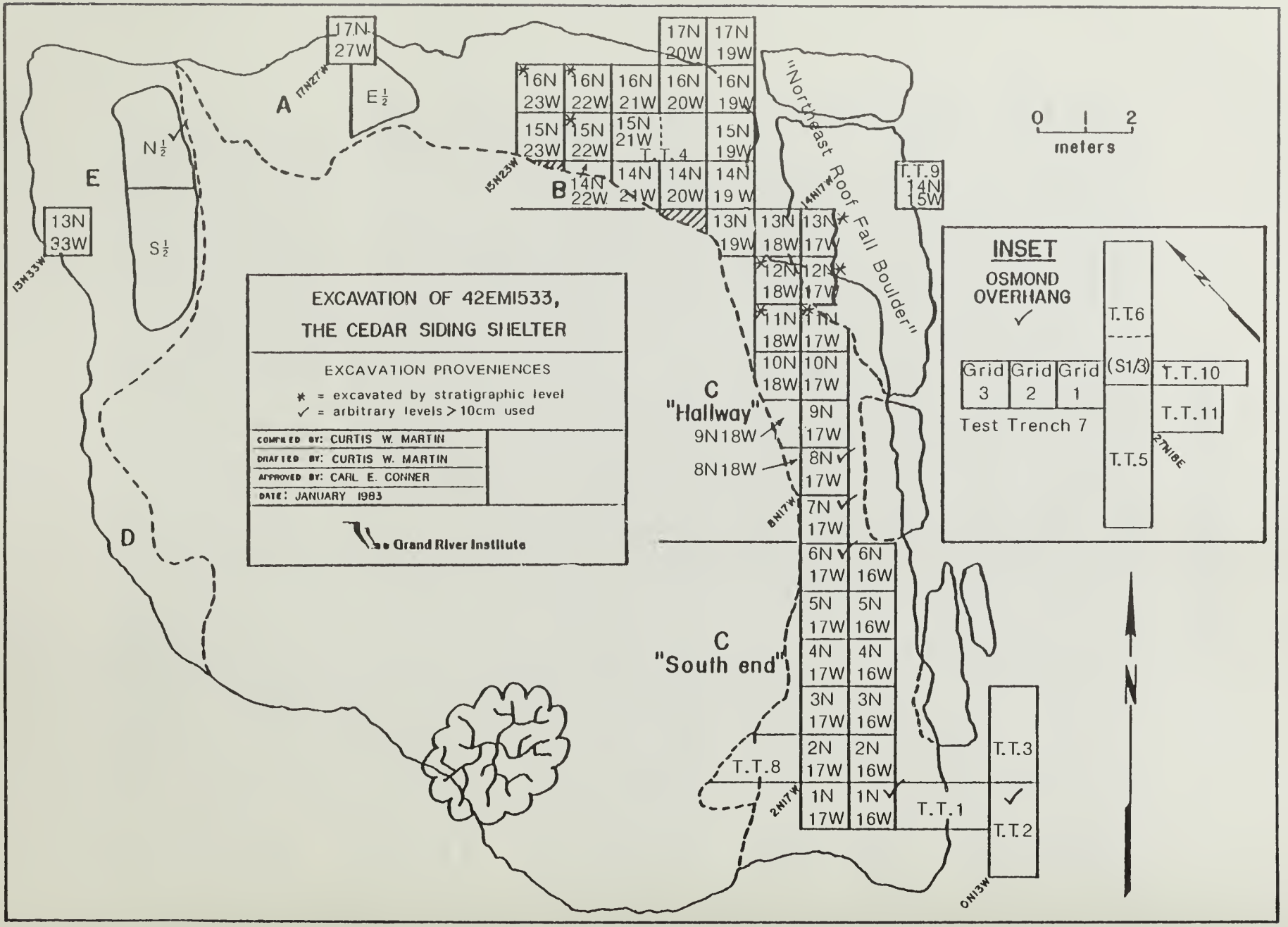


Figure 12. Plan view of Cedar Siding Shelter, showing excavated proveniences at Cedar Rock and the Osmond Overhang.

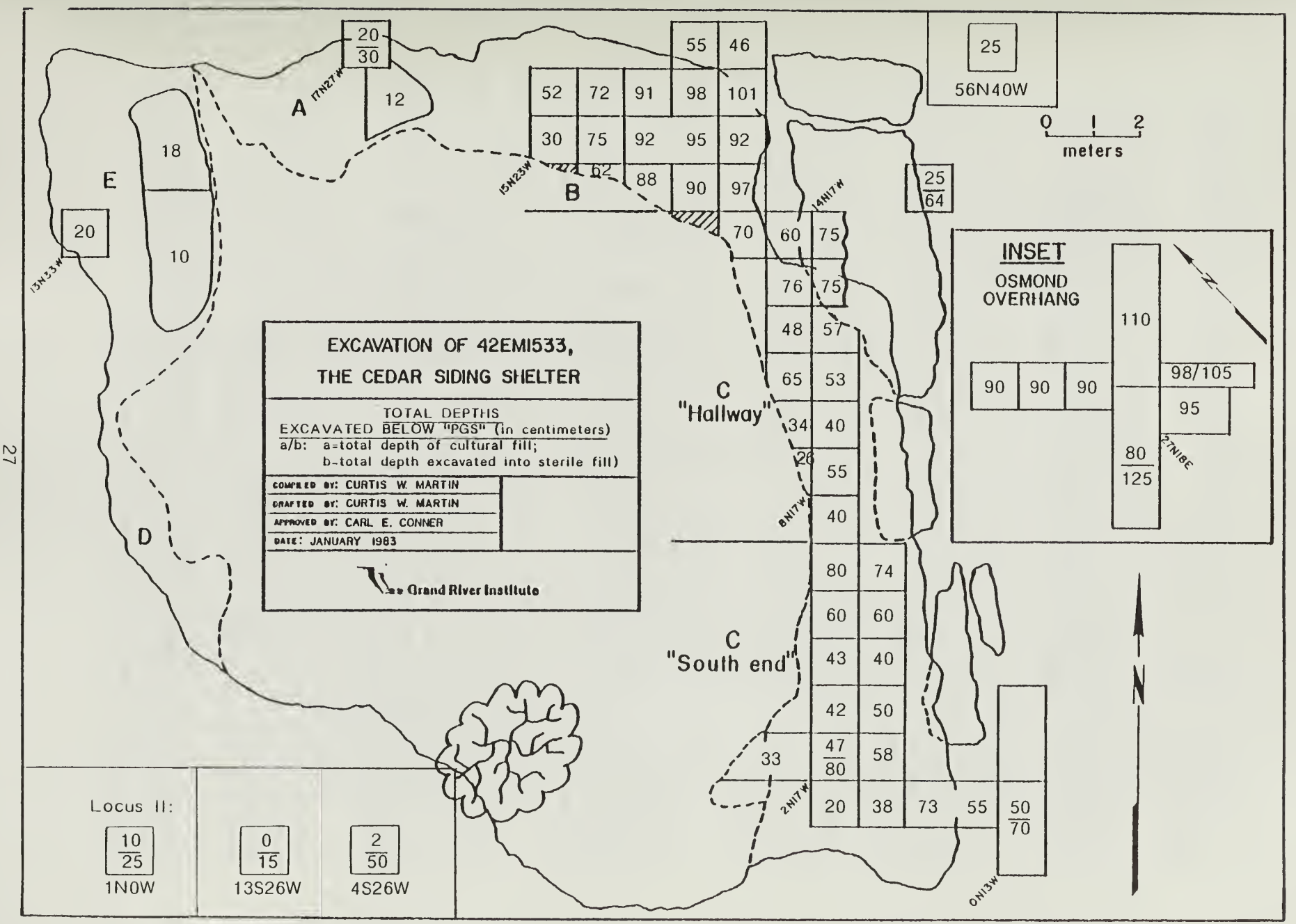


Figure 13. Plan view of Cedar Siding Shelter, showing total excavated depth below pgs (in centimeters) of each grid square.

Within the Osmond Overhang, a sequence of well-defined water- and wind-deposited strata was discovered. Unfortunately, only one of the levels proved to be a culture-bearing unit.

In all cases, with the exception of a portion of the sterile overburden in the Osmond Overhang, fill was trowel-excavated and sifted through shaker screens of 1/8-inch hardware cloth. The Osmond Overhang overburden (overlying Cultural Level I) was shovel excavated and screened until it was determined to be completely sterile, at which point screening was discontinued.

When features such as hearths and storage cists were contacted, they were treated as separate proveniences and excavated as such. Normally, a feature was excavated in halves (to provide a profile view of the fill) and, when present, natural levels were kept separate. A majority of the fill in such features was bagged and processed in the lab as flotation samples rather than screened in the field.

All specimens collected in the field were assigned Field Specimen (F.S.) numbers and bagged separately (chipped stone, groundstone, bifaces, bone, shell, and so forth) according to provenience. All bone (burnt and unburnt) was collected as were all fossils and geological specimens which appeared to be out of natural context (including unmodified nodules of flakable raw lithic material).

Naturally occurring fresh-water snail shells and juniper seed hulls were collected until it was established that they occurred at all depths in nearly all proveniences. All pinyon nut hulls (and other seeds) were retained, as the nearest known existing pinyon trees are at least 2 to 5km away towards the Book Cliffs, and, although it is conceivable that these seeds have been carried into the overhangs over time by birds and other animals, it is also possible that at least some were brought into the site by humans for use as foodstuff.

One hundred forty-six radiocarbon samples were taken from features and various levels of the fill, of which 17 were processed by Beta Analytic of Coral Gables, Florida (see Table 1). Seventeen samples of soil and mud mortar were retained to aid in soils descriptions. Soils descriptions used in the field records were checked (and corrected) in the lab by screening the samples (dry) through a series of U.S. Standard soil sieves (#18, #35, #60, #100, and #200). A Munsell Soil Color Chart was used to arrive at the color determinations referred to in this report.

Thirty flotation samples--collected from hearths, slab-lined cists, and cultural levels--were processed. Each sample was first dry-screened through a 6mm screen to remove gravels, large charcoal, organic matter, and possible artifacts, and then floated in tap water. The floated organic matter was dried and analyzed using 20-power magnification.

Of the 12 features sampled, 3 of the slab-lined hearths and both of the slab-lined storage cists contained carbonized seeds. (Both carbonized and non-carbonized plant materials were recovered). A total of 12 burnt seeds were identified (see Table 2), representing 7 plant families:

Table 1.
Radiocarbon Dating Results From Cedar Siding Shelter (42EM1533)

Sample #	Provenience	Level	C-14 Age Yrs. B.P. ± 10	Approx. Age BC/AD
28	Test Trench 4, Feat. 7 W½, Upper Fill	38-46cm	2880 ± 70	930 B.C.
29	Test Trench 4, Feet. 7 W½, Lower Fill	46-66cm	2670 ± 80	720 B.C.
32	15N19W, SW Corner	0-10cm	1980 ± 100	30 B.C.
47/66/88	14N20W/15N19W	80-93cm	2600 ± 90	650 B.C.
67	Feat. 10, W½ Fill	20-40cm (w/in feat.)	1220 ± 70	A.D. 730
70	Feat. 11 Fill	0-12cm	1170 ± 80	A.D. 780
83	16N21W	50-60cm	2870 ± 100	920 B.C.
94	Osmond Overhang Test Trench 7, Feat. 14	Cult. Lev. I(76-83cm)	910 ± 50	A.D. 1040
109	Beneath floor slab of Feat. 10	52cm	2190 ± 60	240 B.C.
110	7N17W, Feat. 19 S½ Fill	15cm (w/in feat.)	2060 ± 60	110 B.C.
114	1N17W, Feet. 20 Fill	0-20cm	1570 ± 60	A.D. 380
118	12N18W	Level II(15-30cm)	3790 ± 130	1840 B.C.
124	13N17W	Level IV(53-73cm)	3710 ± 90	1760 B.C.
131	11N17W, Feat. 25 Fill	Level III-IV Contact	2820 ± 60	870 B.C.
142	Feat. 24, E½ Fill, Beneath rocks	Level III-IV Contact	3630 ± 80	1680 B.C.
144	12N17W, Feat. 23 Upper Fill	50-60cm	3740 ± 70	1790 B.C.
145	12N17W, Feat. 23 Lower Fill	60-70cm	4100 ± 70	2150 B.C.

Table 2
Summary, Flotation Samples Analysis,
Cedar Siding Shelter

Flotation #	Feature #	Date B.P.	Feature Type/Provenience	Rodent Disturbance	Unburnt Seeds	Burnt Seeds	Other
1	7	2880 ± 70	Slab-lined hearth	None			
2	7	2880 ± 70	Slab-lined hearth	None			
3	7	2670 ± 80	Slab-lined hearth	None	Juniper, ricegrass	Rumex	Peromyscus b.b. frag.
4	7	2670 ± 80	Slab-lined hearth	None	Ricegrass seeds	Juniper frag.	
5	9	No date	Fire zone	Yes	Juniper, legume pod		
6A	10	1220 ± 70	E½ Slab-lined cist, upper	Yes	Grass parts		
6B	10	1220 ± 70	E½ Slab-lined cist, lower	Yes	Grass parts, opuntia, juniper		
7	10	1220 ± 70	W½ Slab-lined cist, upper	Yes	Ricegrass, grass parts, echinocactus		
8	10	1220 ± 70	W½ Slab-lined cist, lower	Yes	Grass parts, ricegrass,	Helianthus, juniper	
9	11	1170 ± 80	Slab-lined hearth	None			
10	14	910 ± 50	Fire pit	Some	Chenopodium		
11	17	No date	Fire pit	None			
12	19	2060 ± 60	S½ Slab-lined cist, upper	None	Juniper, pinyon, atriplex, opuntia	Helianthus	
13	19	No date	S½ Slab-lined cist, lower	Yes	Juniper, pinyon, opuntia, echinocactus		
14	19	2060 ± 60	N½ Slab-lined cist, upper	Yes	Ricegrass, mamillana, juniper, echinocactus		
15	None	No date	11N18W, Overhang C Hallway	None			
16	23	4100 ± 70-3740 ± 70	Slab-lined hearth	None			
17	23	4100 ± 70-3740 ± 70	Slab-lined hearth	None			
18	25	2820 ± 60	Slab-lined hearth, L. III, IV	Some			
19	25	2820 ± 60	Slab-lined hearth, L. IV	None			
20		910 ± 50	Cultural Level I, Osmond Overhang	None		Cactaceae, convolvulus	
21	22	No date	Fire zone	None			
22		pre 2820 ± 60	Beneath Feature 25	None		Opuntia, rhus, echinocactus, ricegrass, snakeweed	
23	23	3740 ± 70	Slab-lined hearth	None			
24	23	3740 ± 70	Slab-lined hearth	None			
25	23	4100 ± 70	Slab-lined hearth	None			
26	24	3630 ± 80	Rock filled hearth	None			
27	24	3630 ± 80	Rock filled hearth	None			
28	23	3740 ± 70	Slab-lined hearth	None			
29	23	3740 ± 70	Slab-lined hearth	None		Echinocactus	
30	23	4100 ± 70	Slab-lined hearth	None			

Cupressaeae	Cactaceae	Anacardiaceae	Polygonaceae
Compositae	Convolulaceae	Graminae	

All of these families presently occur in the area and are common to arid environments in general.

Floral macrospecimens were also recovered during dry screening in the field; these consisted primarily of pinyon and juniper seed hulls. None of the pinyon seeds was burnt, although some were discolored, possibly from roasting. Several of the juniper seeds were burnt, which may indicate use of juniper as fuel and/or foodstuff.

Of the 1,423 bones collected during the excavation, 644 were identifiable, 81 were burnt, and 6 showed evidence of human modification. The identifiable specimens include indeterminate genera of frogs, snakes/lizards, small birds, and at least 18 species of mammals. All of the identifiable mammal remains belong to species found in eastern Utah today: cottontail rabbit (Sylvilagus audubonii and Sylvilagus sp.), jackrabbit (Lepus sp.), least chipmunk (Eutamias cf. minimus), white-tailed prairie dog (Cynonys cf. leucurus), pocket gopher (Thomomys cf. talpoides and Thomomys sp.), Apache pocket mouse (Perognathus apache), Ord's kangaroo rat (Dipodomys cf. ordii), western harvest mouse (Reithrodontomys cf. megalotis), white-footed mouse (Peromyscus sp.), woodrat (Neotoma sp.), meadow vole (Microtus sp.), porcupine (Erethizon dorsatum), coyote (cf. Canis latrans), bobcat (cf. Lynx rufus), mule deer (Odocoileus hemionus), and bighorn sheep (cf. Ovis canadensis).

Eleven of the 33 pollen samples collected were selected for analysis, among them features samples (in an effort to define subsistence patterns), a stratigraphic column (in order to assess the paleoenvironment), and a mano "wash" (for possible food-pollens) (see Appendix B). The results of the analysis reflect an environment similar to that of today's for the period of occupation at the site. Higher-than-average counts of pinyon (Pinus) pollen were noted in Feature 10, a slab-lined cist, suggesting possible storage of nuts. Barrel cactus (Echinocereus), cheno-ams (such as saltbush and winterfat), sagebrush (Artemisia), and rose (Rosaceae) pollens occurred in high frequencies in some of the slab-lined hearths and in the mano wash, indicating apparent economic uses of these plants. Use of this complement of floral resources suggests summer and fall occupation.

STRATIGRAPHY

Traditional stratigraphic analysis was not possible at Cedar Siding Shelter due to a general lack of layering in the soils. As a result, attempts to group the recovered artifacts into cultural complexes have been severely hampered. Generally speaking, the overall lack of stratigraphic variation in the fill would normally imply mixing of the sediments and a consequent lack of an ordered sequence of cultural deposits. This is somewhat borne out by several occurrences of reverse ordering of the radiocarbon dates and temporally diagnostic projectile points within the overhangs, and by several occurrences of tool fragments which fit together which were recovered from significantly different depths (see biface descriptions). Occasional examples of directly inverted dates exist, with younger dates located beneath older ones.

Paradoxically, however, a significant number of in situ fire hearths, storage cists, and other features occur throughout the site at every depth, implying a relative lack of disturbance in the sediments (see "Feature Descriptions"). A moderate amount of rodent activity was evident in the soils at Cedar Siding. This possibly serves as a partial explanation for the occasional inconsistency of the dates. Also, as frequently noted in the archaeological record, earlier types of projectile points were often collected and reused by later peoples, which possibly explains the occurrence of at least three early style points in the upper fill of 42EM1533.

The Osmond Overhang

The major exception to the general lack of stratigraphy at the site is to be found in the subsurface deposits of the Osmond Overhang. As illustrated in Figure 14, a complex series of wind- and water-deposited strata were present to the total depth excavated of 1.25m. The size of the individual particles represented in several of the sand and gravel layers indicates that heavy flooding has occurred within the overhang at least several times over the last few centuries (apparently washing the sediments in from the northwest end of the shelter).

Resting atop a layer of coarse gravel at a depth of from 76 to 83cm below the present ground surface was the only culture-bearing unit present in the shelter. Within this layer of dense ash and charcoal were located two fire zones, Features 22 and 14 (which produced a radiocarbon date of 910 ± 50 years Before Present), and a Rose Springs corner-notched projectile point. All other stratigraphic units in the Osmond Overhang were void of cultural remains (with the exception of a single artifactual flake found at 25 to 65cm during the screening of Test Trench 5--most likely washed in from outside the shelter).

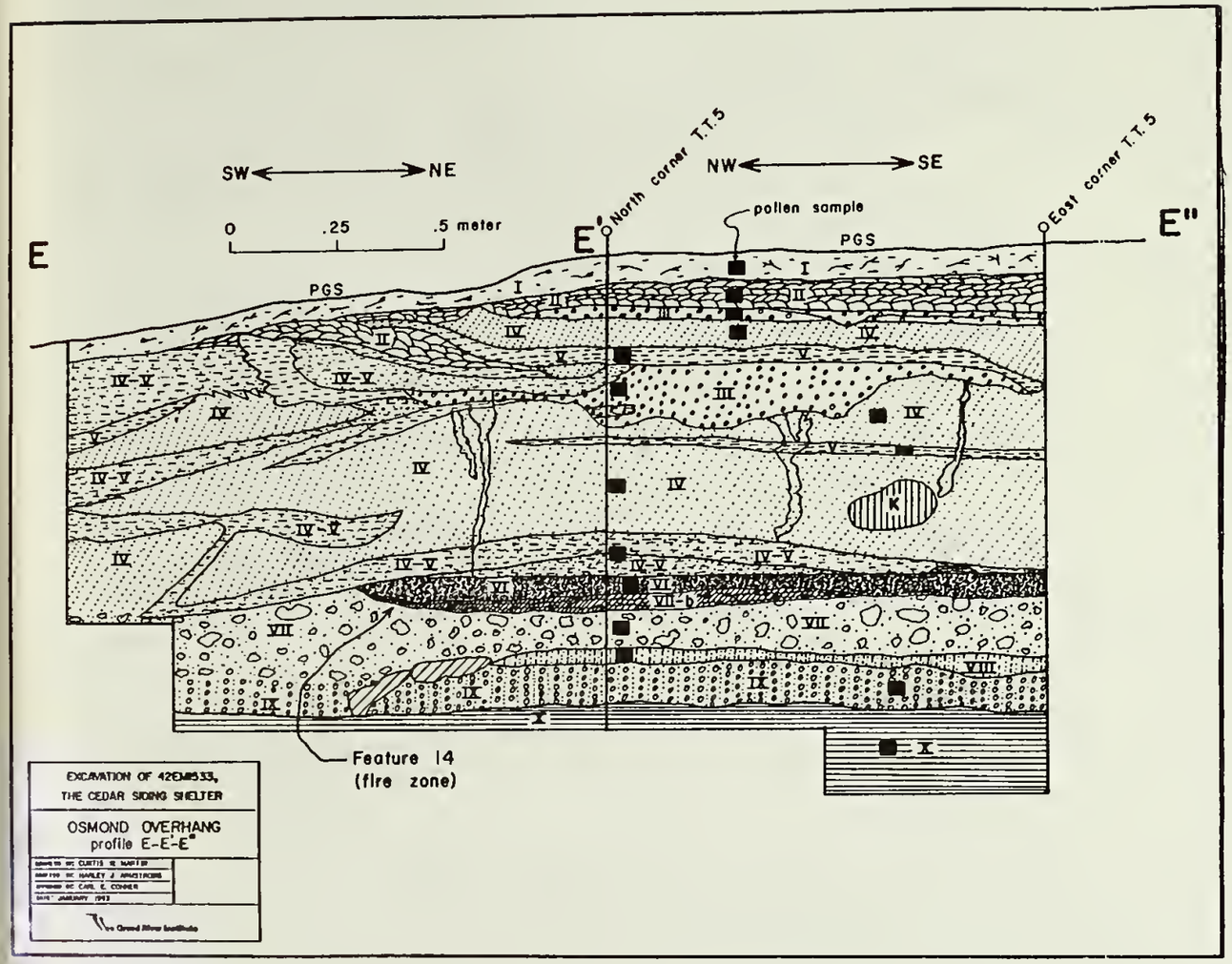


Figure 14. Soils profile, E-E'', Osmond Overhang.

Soil 0-I. Unconsolidated, pale brown (10YR6/3) sandy loam. Contains numerous small plant parts and rodent feces; however, no pebbles or cobbles. Aeolian.

Soil 0-II. Consolidated, pale brown (10YR6/3) sandy loam. Aeolian (much cross-bedding of sediments).

Soil 0-III. Lenses of coarse greyish brown (10YR5/2) sand and gravel. Alluvial (apparently during flash floods entering the overhang from the northwest end).

Soil 0-IV. Dark yellowish brown (10YR4/4) loamy sand. Possibly aeolian (cross-bedding evident in some areas).

Soil 0-V. Greyish brown (10YR5/2) sandy loam.

Soil 0-IV-V. Interbedding of micro-layers of Soils IV and V.

Soil 0-VI, "Cultural Level I". Light grey (10YR7/1) to grey (10YR6/1) pebbly loamy sand. Dense ash content with numerous flecks and chunks of charcoal. Occasional artifactual flakes, tools, and fragments of burnt bone. Numerous small roots running atop underlying gravel layer.

Soil 0-VII. Light brownish grey (10YR6/2) gravel in a matrix of loamy sand to sand. Alluvial (apparently from flash floods).

Soil 0-VIIb. Heat-reddened portion of Soil VII (underlying fire-zones, Features 14 and 22).

Soil 0-VIII. Greyish brown (10YR5/2) loamy sand. Alluvial.

Soil 0-IX. Greyish brown (10YR5/2) gravel in a matrix of loamy sand. Alluvial (apparently from flash floods).

Soil 0-X. Highly consolidated, mottled, light brownish grey (10YR6/2) clay.

K Rodent hole (krotovina).

Overhang B

The deepest deposits of cultural fill existed in Overhang B. Tools, debitage, ash, charcoal, and features were located continuously throughout the total depth of the fill, from the present ground surface to the sandstone bedrock floor. The depth of the soil ranged from 30cm at the extreme west end of the shelter to 101cm in the northeast.

As illustrated in Profiles F-F', Q-Q'-Q''-Q''', and X-X' (Figures 15, 16, and 17), the fill throughout much of the shelter was unstratified pale brown (10YR6/3) loamy sand. The lenses of alluvial yellowish-brown (10YR5/4) loamy sand near the base of the excavations were highly irregular and discontinuous, and consequently unsuitable as excavation levels. The dense, hard layer of white, leached alkali salts visible in Profile Q-Q'-Q''-Q''', which was limited to the rear of Overhang B, was formed by moisture seeping into a crack in the fill after its deposition. Although artifacts were collected as being from "above", "below", or "within" this formation, it is quite apparent that the salt layer was deposited independently of any prior natural or cultural stratigraphic variation in the soil.

It can be seen in Profile F-F' that, in portions of the shelter, the charcoal and ash were slightly denser above the 35 to 45cm level (approximately the presumed level of the "living surface" associated with Features 7 and 12). Because of the intact features, it is known that at least portions of this occupation level remain in situ; however, it was quite impossible to follow, or indeed to find, during excavation. In the artifact analysis section of this report, the tabulations of debitage and other artifacts have been broken down according to arbitrary levels of 0 to 40cm, 40 to 60cm, and below 60cm. The division at the 40cm level is an attempt to isolate the cultural remains deposited prior to the occupation from those laid down during and after. The 60cm division was chosen due to an apparent general decrease in the number of flakes below this level. Several differentiations in the artifact distribution were discovered when these three arbitrary levels were compared statistically (see subsection Spatial Analysis and Activity Areas in "Conclusions and Archaeological Interpretations").

An intriguing phenomenon which was observed in Overhang B is illustrated in Profile X-X' (Figure 17). A narrow (2 to 5cm) crack in the sandstone bedrock floor extended in a northwest to southeast direction from the northern end of the shelter, through Test Trench 4, around Feature 23 (a slab-lined, basin-shaped hearth), and beneath the Northeast Roof Fall Boulder. Along much of the length of the crack, a corresponding crack of equal or slightly greater width extended vertically through the overlying cultural fill almost to the present ground surface. In areas where the fill near the surface differed from that below (as in Profile X-X'), the overlying fill had washed into and filled the crack below, leading directly into the crevice in the bedrock. It is evident that whatever formed the break in the sandstone floor of the overhang also caused the crack in the overlying soil at the same time--apparently contemporaneously with one of the later aboriginal occupations at the site, if not post-dating the last.

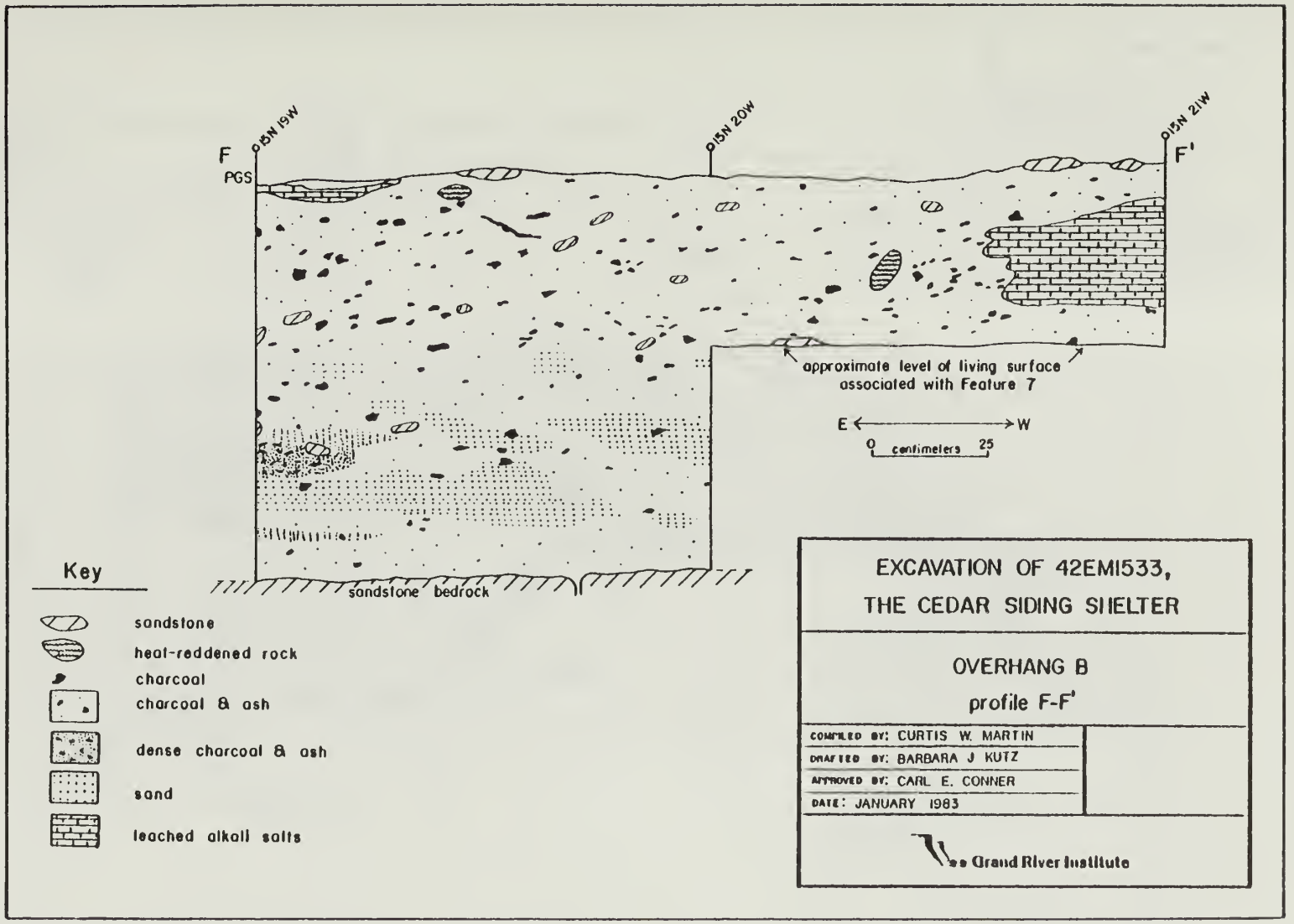


Figure 15. Profile F-F', Overhang B.

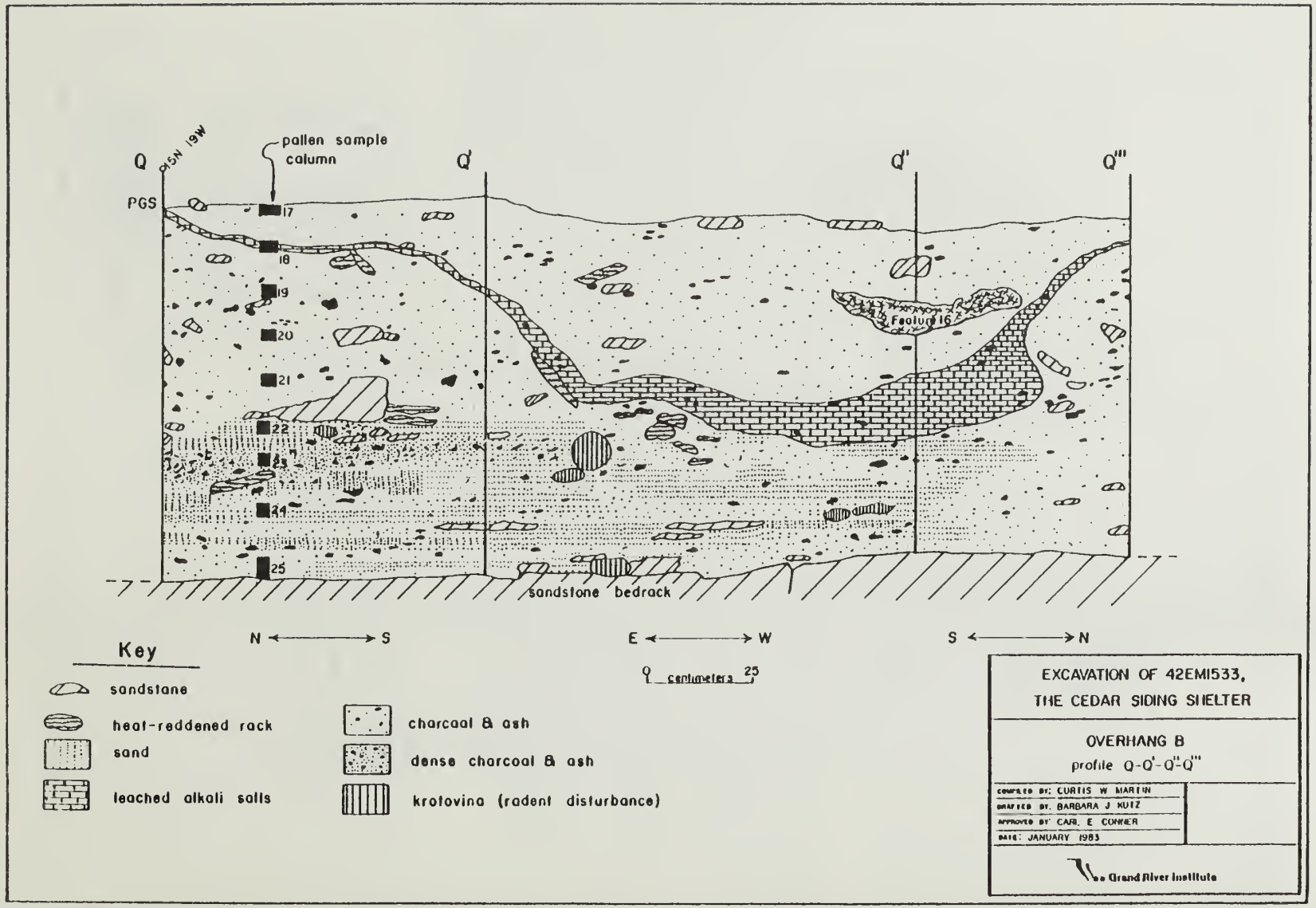


Figure 16. Profile Q-Q'-Q''-Q''', Overhang B.

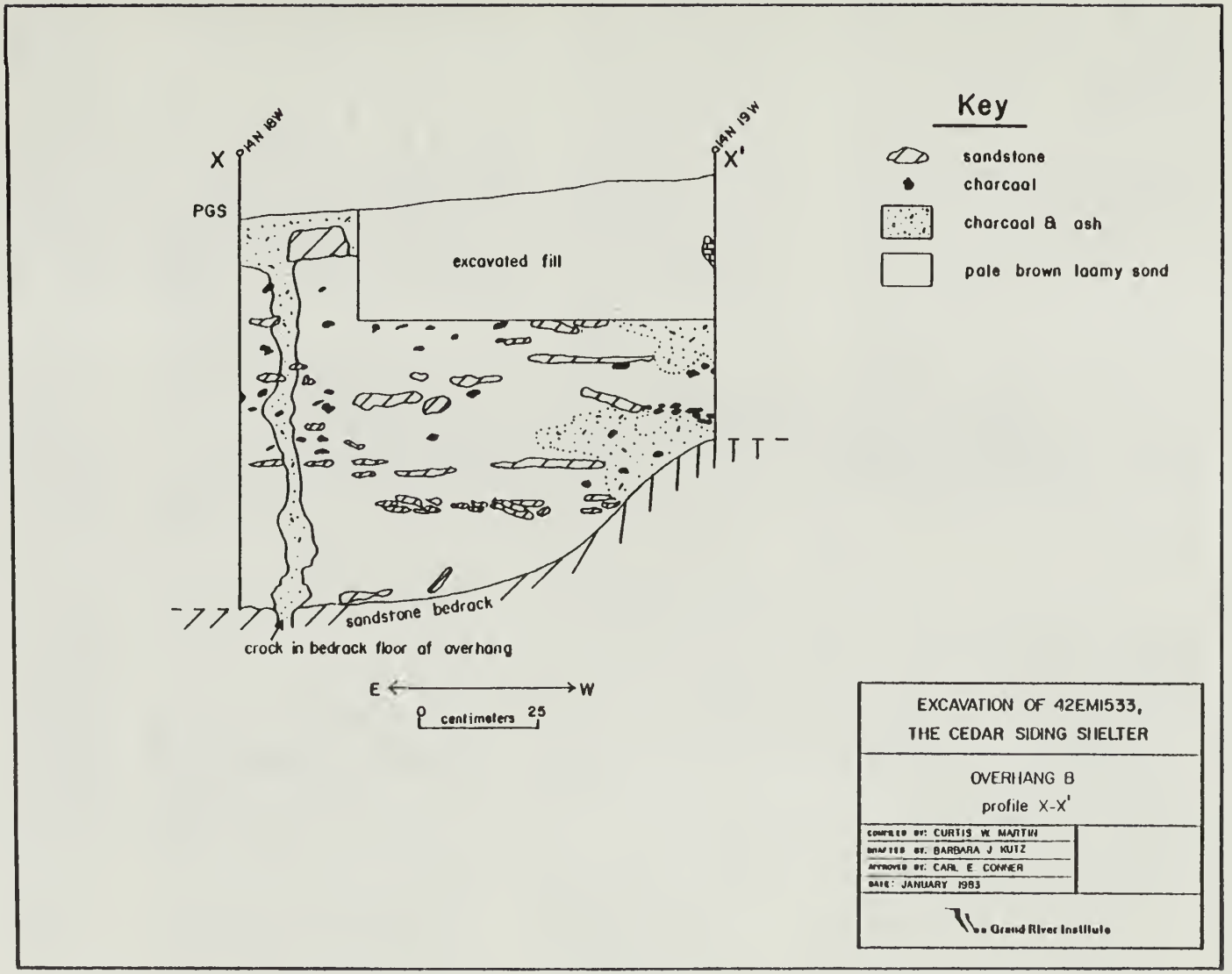


Figure 17. Profile X-X', Overhang B.

It is unlikely that the impact from the collapse of the Northeast Roof Fall Boulder would have been great enough to cause a crack to form in the bedrock, if even in the cultural fill. The possibility of the crack being the result of a fairly recent earthquake, however, is a real one, as there are a number of minor fault zones known in the vicinity of Cedar Siding (Osterwald and Maberry 1974). Such an occurrence quite likely postdates a majority of the radiocarbon samples discussed elsewhere in this report.

In the extreme western end of Overhang B the sediments did separate into discernible stratigraphic levels. In three grid units (15N22W, 16N22W, and 16N23W) excavation was conducted using arbitrary 10cm units within these natural levels, which were classified as Levels B-I to B-III from highest to lowest (see Profile R-R', Figure 18). Level B-I consisted of pale brown (10YR6/3) pebbly loamy sand and ranged in depth from 10 to 20cm. Level B-II was characterized by noticeably fewer pebbles and a greyish cast due to a higher content of ash in the fill compared to B-I. It extended to depths of from 15 to 58cm below pgs. The discontinuous base level, Level B-III, was a water-deposited lens of yellowish brown (10YR5/4), coarse, loamy sand which rested directly upon the sandstone bedrock at depths of from 52 to 75cm. As throughout Overhang B, the artifact density decreased as the depth below pgs increased, with a notable reduction in the number of flakes below the 40cm level (see section on debitage analysis).

To best perceive the lack of easily discernible stratigraphy and the general impression of mixed cultural fill present in Overhang B and elsewhere at Cedar Rock, a schematic profile has been prepared (Figure 19) showing the relative vertical positions of the dated radiocarbon samples and diagnostic projectile points from this portion of the site. Two basal fragments of what are apparently Elko series projectile points were found at significantly different depths (0 to 10cm and 54cm). Although these points are typically considered to be of Archaic-age manufacture, they have also been found in association with post-Archaic components at other sites.

As expected, the latest C-14 samples in this general provenience are near the surface--Sample #32 at 1980 ± 100 B.P. and #70 at 1170 ± 80 B.P. (dates on Figure 19 have been converted to approximate AD/BC dates for ease of interpretation). Below this, however, the sequence of dates becomes somewhat more difficult to interpret. The next youngest date (#47/66/88 at 2600 ± 90 years) was produced from a collection of charcoal chunks on, or near, the bedrock floor of the shelter. In Feature 7, associated with the living surface at approximately 38cm, two relatively early dates were produced--#29 at 2670 ± 80 and #28 at 2880 ± 70 (again with the earlier date directly above the younger one). One meter to the north of Feature 7, at a depth of 50 to 60cm, a charcoal sample dating to 2870 ± 100 B.P. was recovered (#83)--an acceptable date for association with the Elko side-notched point (E287) from Test Trench 4 at the same depth.

If allowances are made for a greater than one standard deviation variance in the two dates from the fill of Feature 7 (as represented by the plus or minus factors reported herein) and possibilities such as long-dead wood being used in the fire in the upper fill of the hearth are considered, then a mean

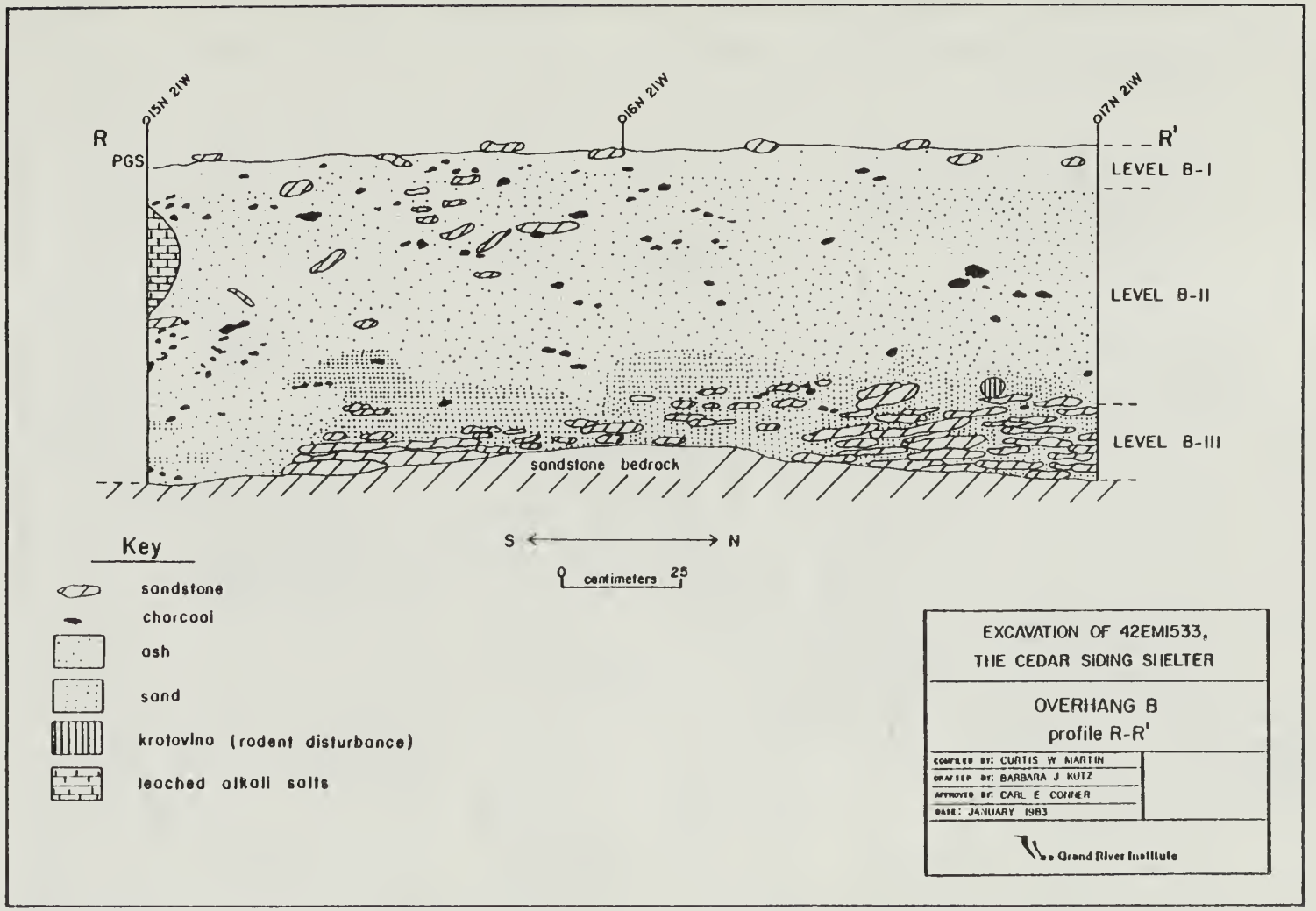


Figure 18. Profile R-R', Overhang B.

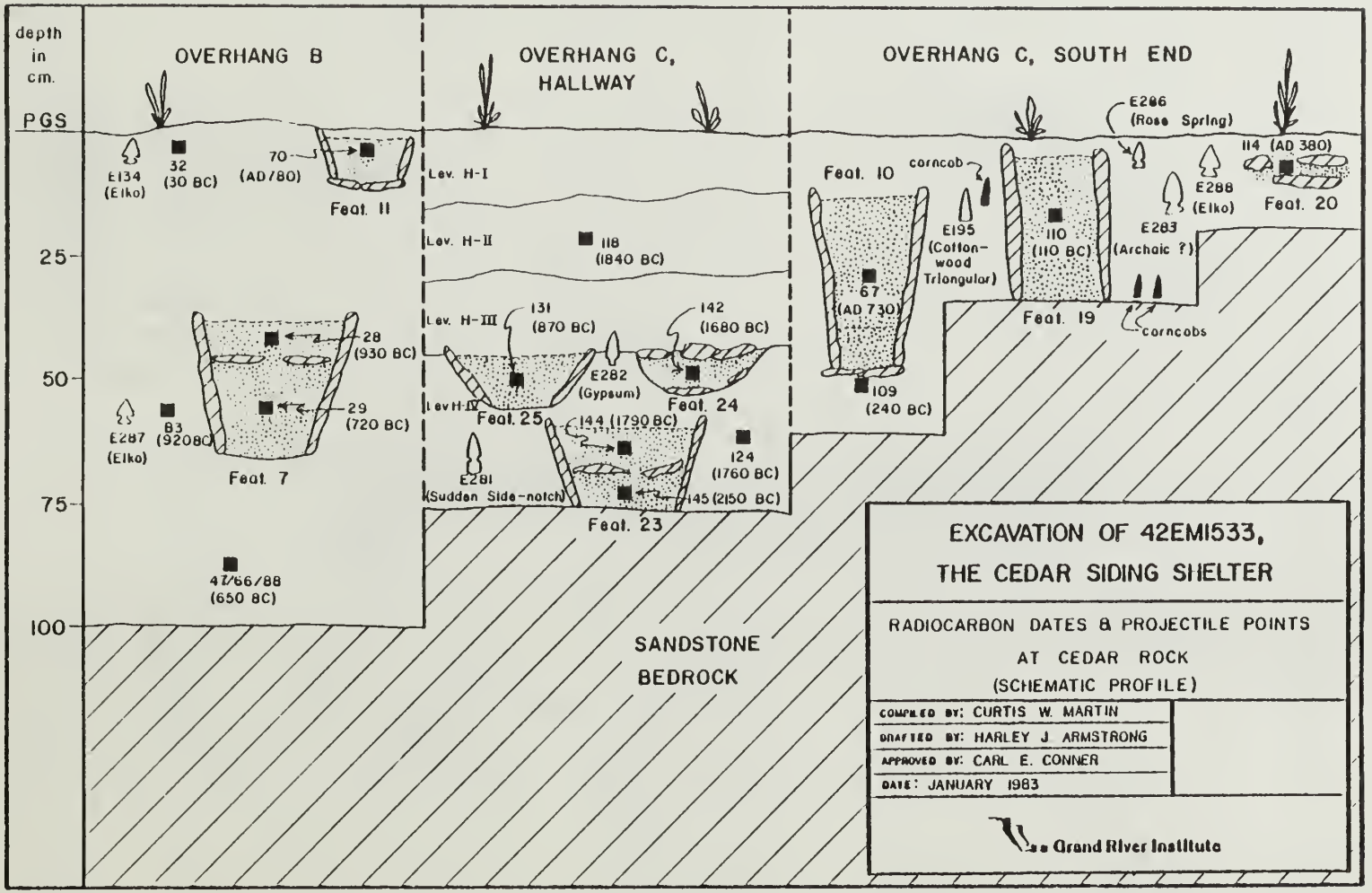


Figure 19. Schematic profile of Overhangs B and C showing relative depths of features, radiocarbon dates, and diagnostic specimens.

date of roughly 2775 B.P. can be assigned to this hearth. With this in mind, then the sequence of dates in Overhang B can be considered acceptable (with the exception of "floor" sample #47/66/88).

Overhang C, Hallway

The stratigraphy in The Hallway was comparable to that discussed for Overhang B. Most of the fill again consisted of pale brown loamy sand with occasional discontinuous lenses of coarser sand near the bedrock floor. In several 1-meter grid squares near the north end of The Hallway (11N17W, 11N18W, 12N17W, 12N18W, and 13N17W), it was possible to separate the pale brown (10YR6/3) loamy sand into four fairly distinct natural levels and excavate by arbitrary 10cm levels within these (Profile HH-HH'-HH'', Figure 20).

Once again, these natural units (Levels H-I through H-IV) did not vary greatly in terms of the types or amounts of artifacts recovered, and none of the contact zones between the levels provided any distinct evidence of being a "floor". There is, however, strong evidence for the existence of an occupation level at the H-III/H-IV contact based upon the number of features discovered at this interface (hearths #21, #24, #25, and #29).

Level H-I consisted of lenses of pebbly to very pebbly, loamy sand with a very light ash and charcoal content. It extended to a depth of from 5 to nearly 20cm below the present ground surface. Below this, Level H-II was significantly less pebbly and slightly ashier than H-I. It ranged from 13 to 16cm in thickness. Radiocarbon Sample #118 from this level produced a date of 3790 ± 130 years before present.

Level H-III, the level of densest ash and charcoal, directly overlay the contact zone "living surface" into which the four above-mentioned hearths were constructed. Samples from two of these features (24 and 25) produced dates of 3630 ± 80 B.P. and 2820 ± 60 B.P., respectively. A Gypsum Point (E282) was also collected at this interface.

The lowest level, H-IV, ranged from a depth of 28 to 38cm at the III/IV contact to the bedrock floor at 48 to 76cm. The pale brown loamy sand of Level H-IV contained very light ash and charcoal and was interspersed throughout with alluvial lenses of pebbly loamy sand similar to those in Level H-I. From within H-IV were produced radiocarbon dates of 3710 ± 90 B.P. (Sample #124 at 53 to 73cm) and, from the fill of Feature 23, Samples #144 and #145 at 3740 ± 70 B.P. and 4100 ± 70 B.P., respectively. A basal fragment of a Sudden Side-notched projectile point and a high density of decortication flakes were also found in Level H-IV (see section on artifact analysis).

Referring again to the Schematic Profile (Figure 19), a situation not unlike that presented for Overhang B is illustrated for Overhang C, Hallway. A surprisingly early and unexplained date was produced from Level H-II, as mentioned above. In fact, this date (3790 ± 130 years) was next to the oldest date from Cedar Siding (second only to Sample #145 from the lower fill of Feature 23).

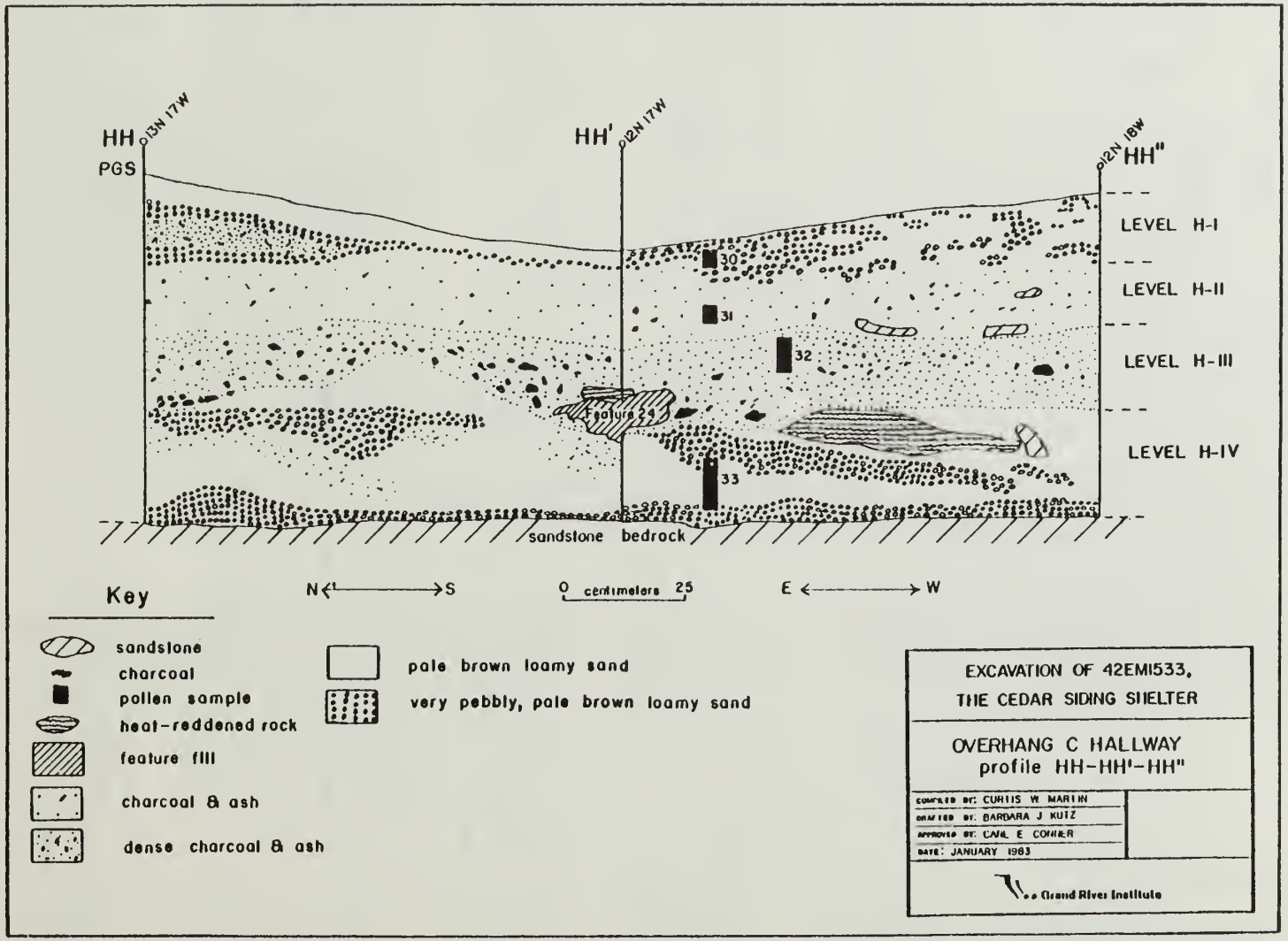


Figure 20. Profile HH-HH'-HH'', Overhang C, Hallway.

If the dates from Features 24 and 25 at the H-III/H-IV interface can be trusted, and there is no apparent reason why they should not be, it appears that this zone served as an occupation level for a long period of time--a span of over 800 years is represented by the two dates. Taking this into consideration, all of the dates and projectile points from The Hallway (with the exception of Sample #118) provide an informative sequence of dated cultural deposits for the lower fill at Cedar Rock. It is conceivable that at least a portion of the cultural materials from the H-III/H-IV contact is associated with the "living surface" in Overhang B (Features 7 and 12).

As described earlier, the Northeast Roof Fall Boulder appears to have broken off of the overhanging rock and come to rest on the cultural fill near the end, if not after, the latest aboriginal occupations at Cedar Rock. In Grid Squares 12N17W and 13N17W, stratigraphic unit Level H-I could be discerned in the grid walls directly beneath the underside of the boulder. Distance below pgs in these grids was measured from the ground surface at the nearest exposed face of the roof fall boulder.

Overhang C, South End

South of approximately the middle of The Hallway, the pale brown fill begins to grade into the pebbly, light brownish grey (10YR6/2) loamy sand which characterizes the entirety of the South End of Overhang C. The cultural fill here is loose, dry, and pebbly, and appears to be primarily wind-deposited. It is moderately ashy throughout and completely unstratified.

The cultural fill, which ranges in depth from 20 to 80cm, rests atop a jumbled layer of sandstone "roof fall" (from approximately the 6N line southwards). The sandstone chunks and spalls (ranging in size from pebbles to small boulders) occur within a matrix of brown (10YR5/3) sand; they continued to the total depth of 80cm excavated in a sub-sterile test in Grid Unit 2N17W (33cm below the base of the cultural fill). This "roof fall" possibly includes partially decomposed bedrock from beneath the cultural fill. Near the bottom of the test a single 10cm-diameter lump of mottled light brownish grey clay was found, similar to that outcropping at the back of the Osmond Overhang and at the base of Test Trench 3.

As illustrated in the Schematic Profile (Figure 19), the C-14 dates from the cultural fill outside the slab-lined cists indicate an early date of 2190 ± 60 B.P. (Sample #109) from near the roof fall layer directly beneath a floor slab of Feature 10. A later date from the South End was obtained from Sample #114 (Feature 20, fire zone) at 1570 ± 60 B.P., at a depth of from 0 to 20cm.

The two slab-lined storage cists (Feature 19, for comparative purposes, has been included in the discussion of the South End due to the similarity of the cultural fill in the southern portion of The Hallway) produced dates of 2060 ± 60 B.P. (Sample #110, Feature 19) and 1220 ± 70 B.P. (Sample #67, Feature 10, Upper Fill). In both cists, the interior fill from which the charcoal (and partially burnt juniper, in the case of Feature 19) was collected, is

similar or identical to that surrounding and overlying the features. By all appearances, any materials which were being stored in these cists were removed by the site's inhabitants and the features were abandoned to become filled with washed and wind-blown soil from the surrounding fill.

Two relatively late projectile point fragments were recovered from fairly shallow depths in the South End. Specimen E195, a Cottonwood Triangular base, was found at 20 to 30cm, and a Rose Springs Corner-notched point (E286) at 10cm below pgs. These points are conceivably associated with Feature 20, Feature 10, or Feature 11 (Overhang B), or even later occupations (see section entitled "Diagnostic Artifacts Analysis").

Also near the surface of the South End, however, are two earlier-style projectile points, E288, an apparent Elko-series base, and E283, a large, notched biface of possibly Archaic manufacture. These points were found at 0 to 20cm and 20 to 25cm, respectively.

Test Trenches 1, 2, and 3 were excavated in order to investigate the subsurface deposits at and beyond the mouth of Overhang C, South End. The light brownish grey, loamy sand continues into these proveniences beyond the shelter; however, it becomes more densely packed (due to increased exposure to precipitation), more washed in appearance, and contains a significantly lower density of cultural ash and artifacts. Also, the fill here is underlain by clay deposits rather than roof fall as within the shelter.

Other Proveniences

The soils, cultural remains, and stratigraphy of the remaining excavated grids at Cedar Siding Shelter have been previously discussed in the "Site Description" section of this report.

FEATURE DESCRIPTIONS

Twenty-eight features, or non-portable artifacts, were unearthed and recorded during the excavations at Cedar Siding (see Figure 21). Twenty-two of the features consisted of hearths and fire zones of a variety of styles: 10 were mere concentrations of ash, charcoal, and fire-altered rock; 4 were fire zones, or areas of heat-reddened soil not associated with formal features; 5 were slab-lined hearths; and the remaining 3 were shallow basin-shaped fire pits, one of which was notably large and filled with chunks and spalls of sandstone. The 6 remaining features included a circle of cobble-sized stones (however, no evidence existed that a fire had ever been constructed within the circle), 2 elaborately constructed slab-lined storage cists, a possible dry-laid masonry wall, a juniper bark mat, and a small grass mat.

Possible Hearths

Ten of the excavated features were designated as "possible hearths". Although ash, flecks and chunks of charcoal, and heat-reddened and fire-cracked rock existed throughout all of the cultural fill in the overhangs at 42EM1533, these features were concentrations of said materials which gave the distinct impression of being remnants of once formal features built to contain fire and/or hot coals. In situ burnt soil was present at several of the possible hearths. The disturbance of the features was probably due, in a majority of cases, to subsequent human occupations at the site rather than strictly to environmental factors. These possible hearths included Features 1 through 5, 12, 17, 27, 21, and 29 (see Figure 21).

Fire Zones

Four "fire zones" were recorded at Cedar Siding Shelter. These features consisted of areas in the cultural fill which presented distinct evidence of in situ burning in the form of reddened soil or gravel, and charcoal or ash, but lacked formal features such as stone circles, basins, or excavated pits. Features 8/9 (originally thought to be two separate features), 20, 14, and 22 are fire zones (see Figure 21). Features 14 and 22 are nearly identical features located in Cultural Level I of the Osmond Overhang; in fact, all materials recovered from this shelter either lay directly in one of these fire zones or were in apparent association.

Slab-lined Hearths

The most common, intact, formally constructed type of feature discovered at Cedar Siding was the slab-lined hearth. Although the five features of this category varied a great deal in their construction, design, and age, all consisted of pits or basins built to contain fire (presumably for cooking purposes) and all were lined on the walls and/or floor with sandstone slabs.

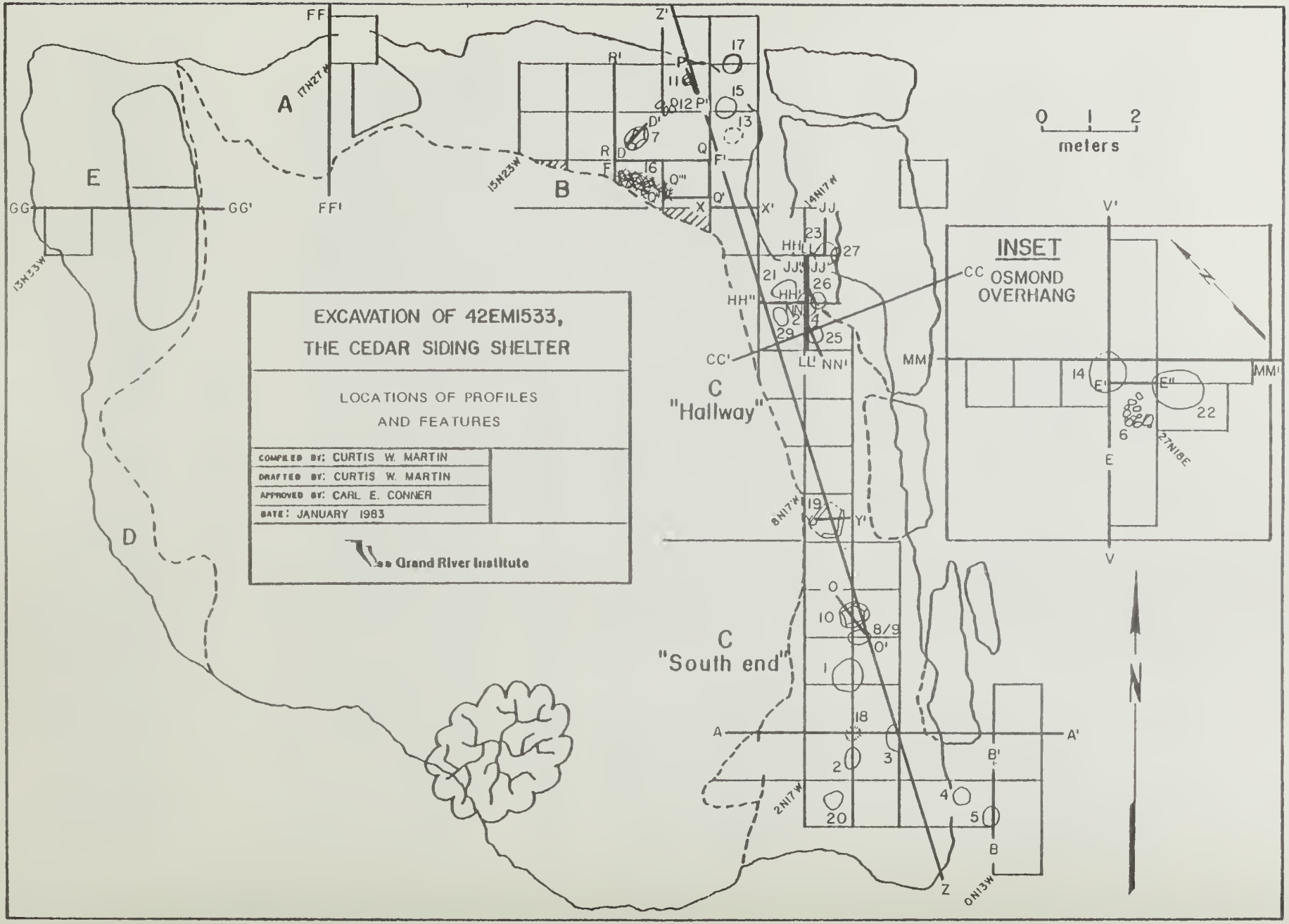


Figure 21. Plan view of Cedar Siding Shelter, showing locations of profiles and features.

Heat retention was possibly the primary purpose of this construction technique. It is also conceivable that the slabs aided in keeping loose dirt out of the hearth and out of the food being prepared; in the deeper, steep-walled features, the slabs may also have helped to retain the earthen walls.

It is in these slab-lined hearths that the densest and least disturbed charcoal was located. It is interesting to note that all 5 of these structures were located in Overhang B and in the adjacent north end of The Hallway of Overhang C.

Feature 7

Located in the western half of Test Trench 4 (Grid Unit 15N21W), this hearth was one of three deep, slab-lined features discovered on the site (the others, Features 10 and 19, being storage cists). The upper edge of the vertical slabs lining the walls of Feature 7 indicated that it was apparently associated with an aboriginal living surface at a depth of approximately 38cm below the modern ground surface in Overhang B (see Figure 22 and Plates 6a and b). As detailed elsewhere in the report, the only stratigraphic evidence of this occupational "floor" was a slight decrease in the amount of charcoal, flakes, and other cultural debris below the 40cm arbitrary level.

Feature 7 was roughly circular in plan view with interior diameters of from 37 to 42cm at the top and from 18 to 20cm at the base. Six sandstone slabs, ranging in size from 31 x 31 x 2cm to 21 x 11 x 2cm, were placed vertically around the inside perimeter of a roughly 30cm deep hole sloping inward toward the floor of the hearth. An additional, smaller slab was placed behind the upper portions of two of the upright slabs, apparently to act as a support. No stones were placed in the bottom of the hole, and no distinct "floor" was present.

The feature was excavated by halves, horizontally, and by "Upper Fill" and "Lower Fill". The base of the "Upper" level was defined by a jumbled layer of primarily horizontal sandstone slabs and chunks resting in the fill at 14cm below the rim. This possibly represents a collapsed and broken lid which once rested atop Feature 7, or a crudely constructed "second floor". Dense charcoal existed both above and below this sandstone layer and it is obvious that the hearth was reused after these stones had fallen (or been placed) on top of the lower charcoal.

Radiocarbon Samples #26 and #28 were removed from the Upper Fill and #29 and #30 from the Lower Fill. Sample #28 produced a date of 2880 ± 70 B.P. and #29 was dated at 2670 ± 80 B.P.

In addition, Feature 7 produced Flotation Samples #1 and #2 from the Upper Fill, and #3 and #4 from the Lower Fill. Pollen samples were removed from both Flotation Samples #2 and #3. Analysis of these samples produced unburnt juniper and Indian ricegrass seeds and seed fragments, and burnt rumex and juniper seeds.

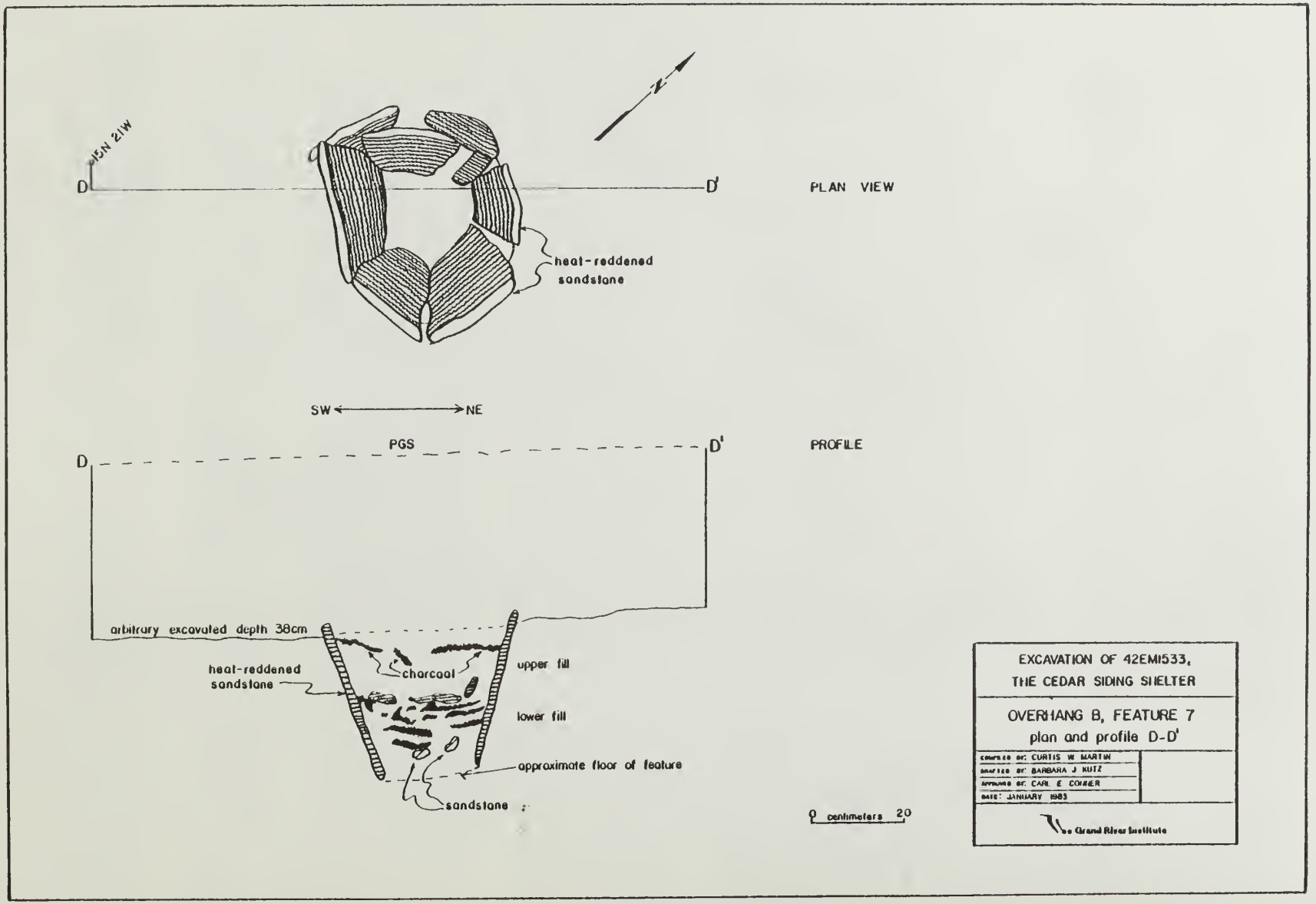


Figure 22. Plan and profile of Feature 7, Overhang B.

a. Feature 7, slab-lined hearth, with east half of upper fill removed. Note charcoal lenses exposed above layer of heat-reddened slabs.

b. Feature 7, slab-lined hearth, after removal of fill.

PLATE 6

Feature 11

Immediately beneath the present ground surface (from 0 to 23cm) near the northern drip line of Overhang B in Grid 16N20W, was Feature 11 (see Figure 23 and Plates 7a and b). It consisted of a small (35cm diameter), circular, shallow, basin-shaped depression which had been lined with sandstone slabs on its "floor" and around the perimeter. One of the upright slabs, forming the north wall of the hearth, stood vertically, and rose 10cm higher than any of the other stones (possibly to serve as a wind break or deflector or possibly because the other stones have slumped outwards). The remaining 6 upright slabs all sloped toward the center of the basin, the bottom of which was lined with 5 horizontally placed slabs. The vertical slabs ranged in size from 12 x 11 x 2cm to 26 x 23 x 7cm; the floor slabs were generally smaller.

The feature fill, up to 8cm in depth, consisted of ashy, loamy sand and several large chunks of charcoal. Radiocarbon Sample #70 produced a date of 1170 B.P., indicating a Fremont-age date for the use of the hearth. Flotation Sample #9 was also obtained from Feature 11.

Feature 23

Identified within Level IV (see discussion on Stratigraphy) and resting directly on the bedrock floor of the north end of The Hallway, Feature 23 consisted of a crudely constructed, slab-lined basin (see Figure 24 and Plates 8a and b). It was located primarily in Grid Square 13N17W, beneath the Northeast Roof Fall Boulder, at a depth of approximately 45 to 69cm below pgs (measured at the edge of the boulder).

The roughly circular hearth measured up to 60cm in diameter and 19cm deep. The sides of the basin were haphazardly lined with sandstone spalls and slabs (which were heat-reddened) measuring up to 22cm in diameter. Numerous spalls and chunks lay within the charcoal and ashy soil fill of the hearth--a fairly dense horizontal layer of spalls and chunks was encountered approximately halfway between the top of the feature and its base (which separated the Upper and Lower Fills).

Flotation Samples #16, #17, #23, #24, #25, #28, #29, and #30 and Radiocarbon Samples #124, #126, #129, #130, #138, #139, #140, #143, #144, and #145 were obtained from Feature 23. In addition, two pollen samples were removed from Flotations #29 and #30 for analysis. Burnt echinocactus seed was discovered during analysis of the flotation samples.

Radiocarbon Samples #144 and #145 (from the Upper and Lower fill of the feature, respectively) produced dates of 3740 ± 70 B.P. for the charcoal above the sandstone layer (presumably a reuse of the feature) and 4100 ± 70 B.P. on the base of the feature.

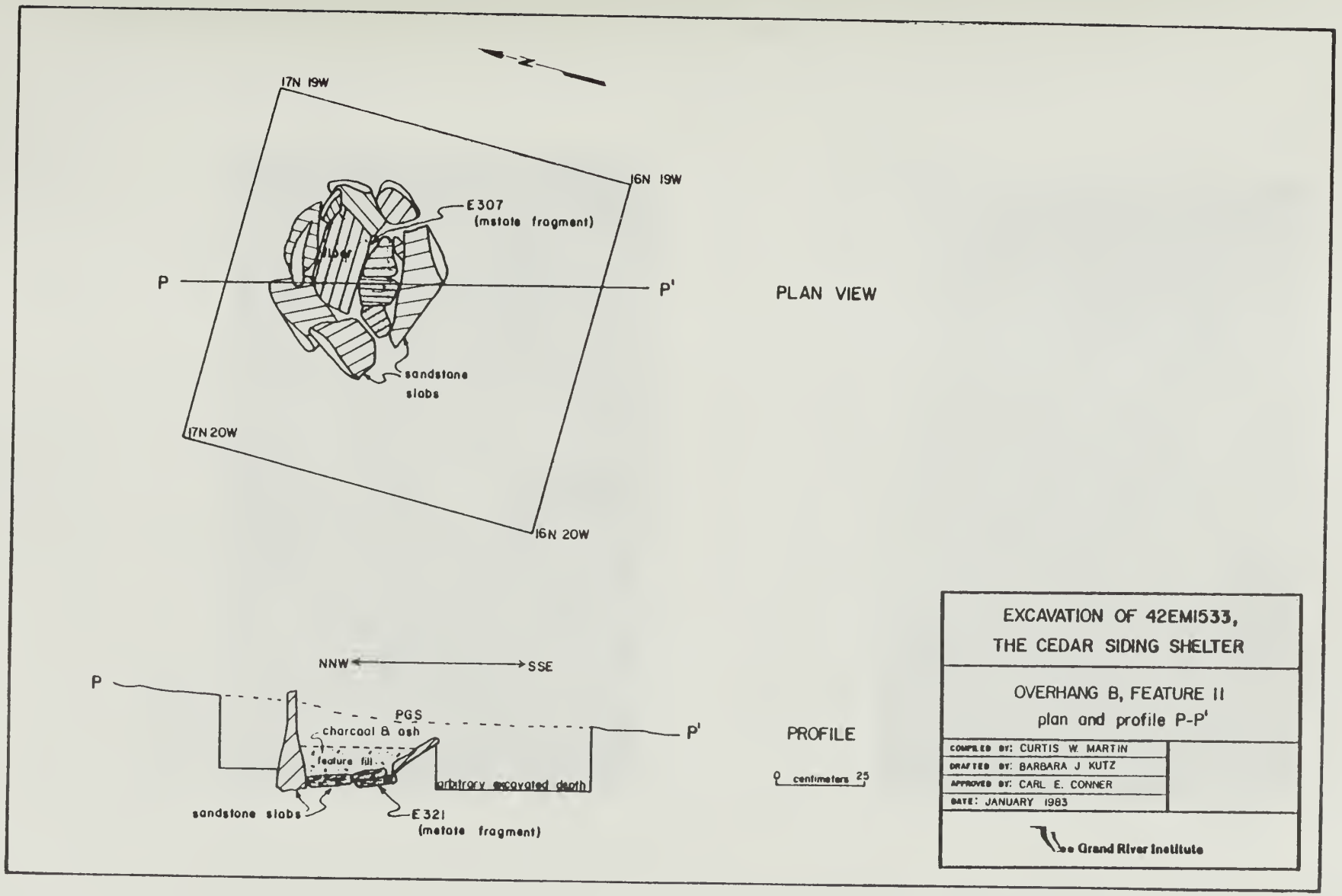
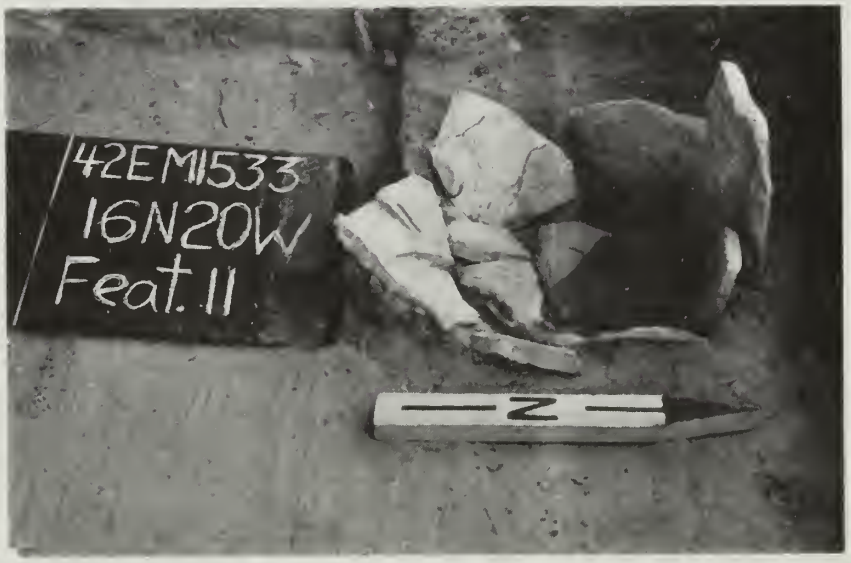


Figure 23. Plan and profile, Feature 11, Overhang B.

a. Feature 11, slab-lined hearth, prior to removal of fill. Note Feature 7, also a slab-lined hearth, at 38cm depth on left.



b. Feature 11, slab-lined hearth, after excavation of fill.

PLATE 7

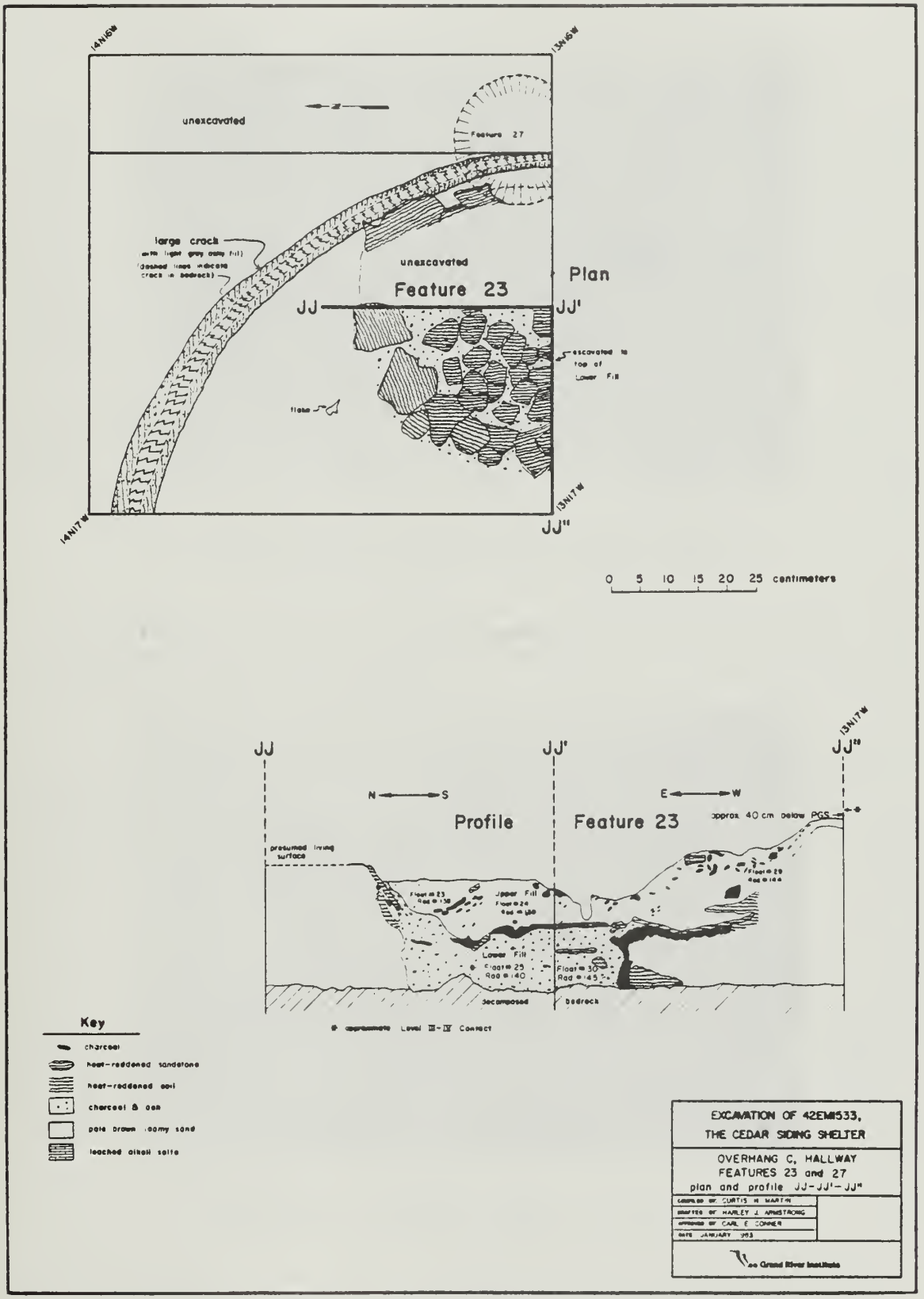
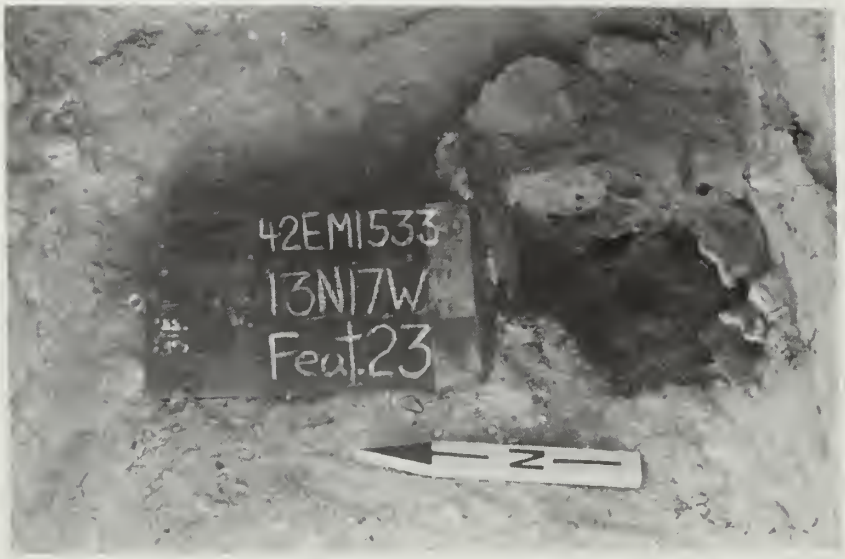
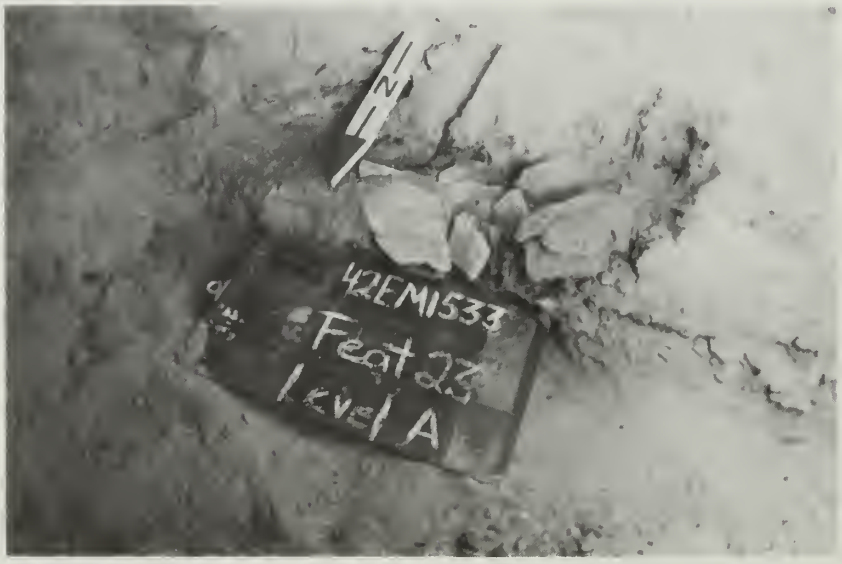


Figure 24. Plan and profiles, Features 23 and 27, Overhang C.



a. Feature 23, slab-lined hearth with fill removed from northeast quarter. Note density of charcoal and horizontal slabs dividing upper and lower fill.



b. Feature 23, south half, with upper fill removed and thick layer of horizontal sandstone slabs exposed.

PLATE 8

Feature 25

Intrusive into Level IV (from the Level III-IV contact at a depth of 32cm) and situated in Grid 11N17W (The Hallway) was Feature 25, a circular, shallow, basin-shaped hearth with several sandstone slabs sloping inward around the perimeter (see Figure 25). No slabs lay on the bottom of the hearth; the overall construction was very similar to that of Feature 23. Six large slabs (up to 23cm in diameter) and several smaller fragments were used to line the walls of the pit. Ashy soil and chunks of charcoal filled the basin and diffused into the cultural fill below. There was no distinct floor or base to the hearth. The feature ranged from 45 to 65cm in diameter (to the outer edges of the slabs), and the original depth of the basin appears to have been approximately 15cm.

Flotation Samples 18 and 19 and Radiocarbon Samples 128 and 131 were collected from the fill of Feature 25. Analysis of the flotation samples showed a presence of burnt Opuntia, Rhus, echinocactus, ricegrass, and yellow-seeds.

Feature 26

One meter to the north of Feature 25 in Unit 12N17W was Feature 26. Also built into a shallow, basin-shaped pit within Level III of The Hallway, it was intrusive into the extreme eastern end of Feature 24, and slightly higher in the fill (see Figure 26 and Plates 9a and b).

Five heat-reddened sandstone slabs (up to 17cm across) and several additional small fragments remained around portions of the perimeter of the hearth, sloping inward. Once again, no stones lined the bottom of the pit. The circular hearth measured 42cm in diameter and up to approximately 13cm in depth. The fill appeared identical to that of the surrounding, Level III cultural fill. No flotation or radiocarbon samples were taken.

Shallow, Basin-shaped Fire Pits

Three of the features recorded at Cedar Siding Shelter have been classified as shallow, basin-shaped fire pits. In actuality, there is a great deal of diversity represented by these hearths, as is evident in the following descriptions, but they do have in common an unlined, shallow-walled basin excavated into the underlying cultural fill.

Feature 13

Located at a depth of 68 to 78cm below pgs in Overhang B, near the center of Grid Unit 15N19W (approximately 24cm above the bedrock floor),

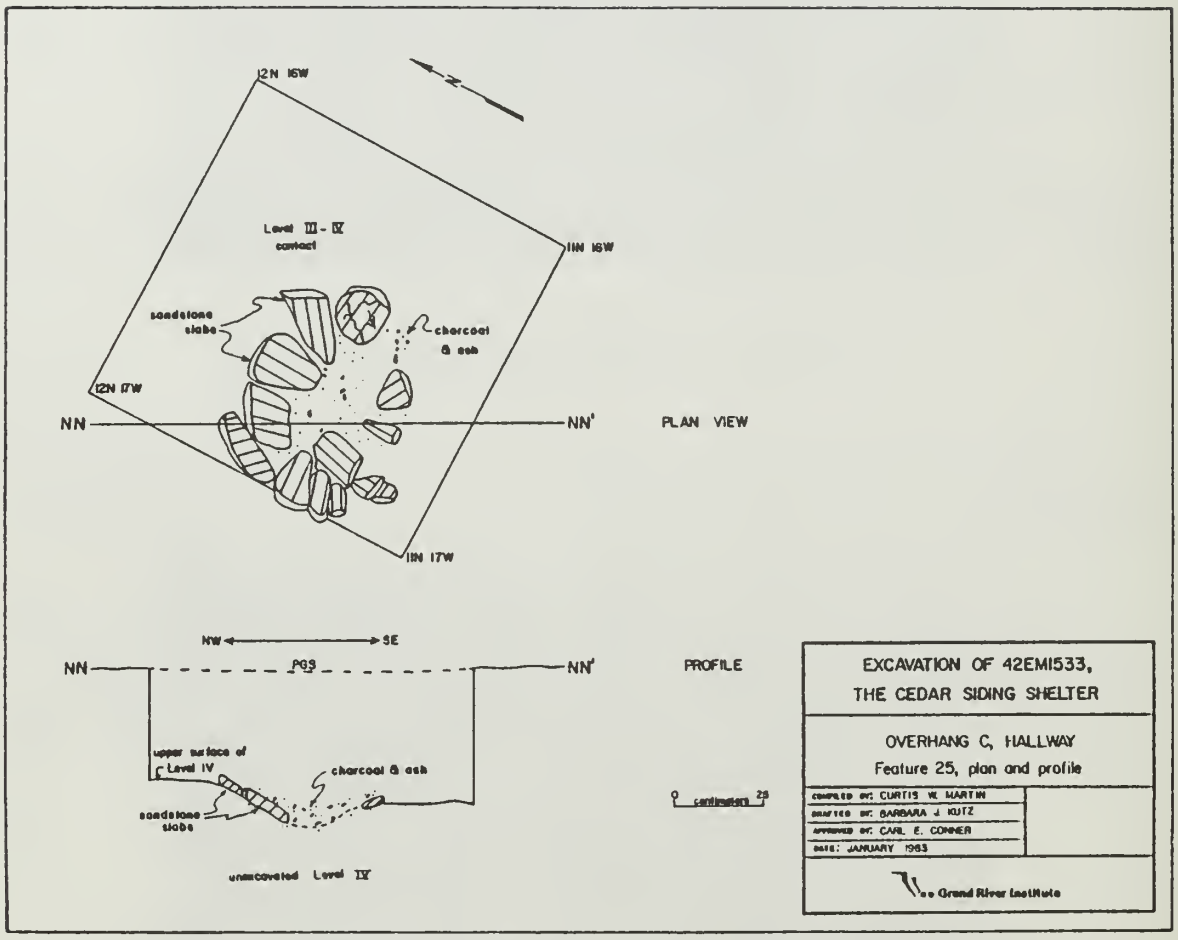


Figure 25. Plan and profile, Feature 25, Overhang C.

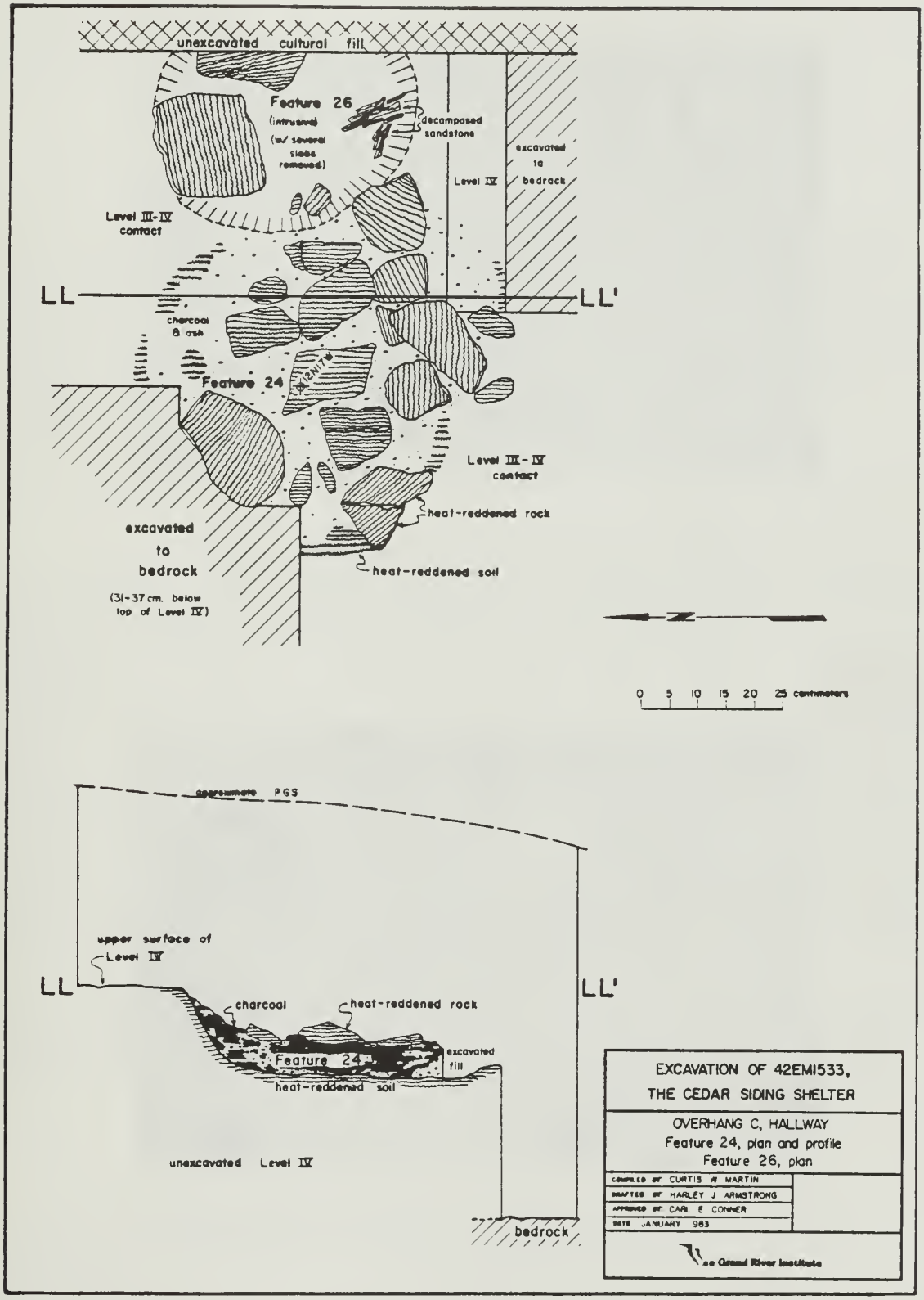
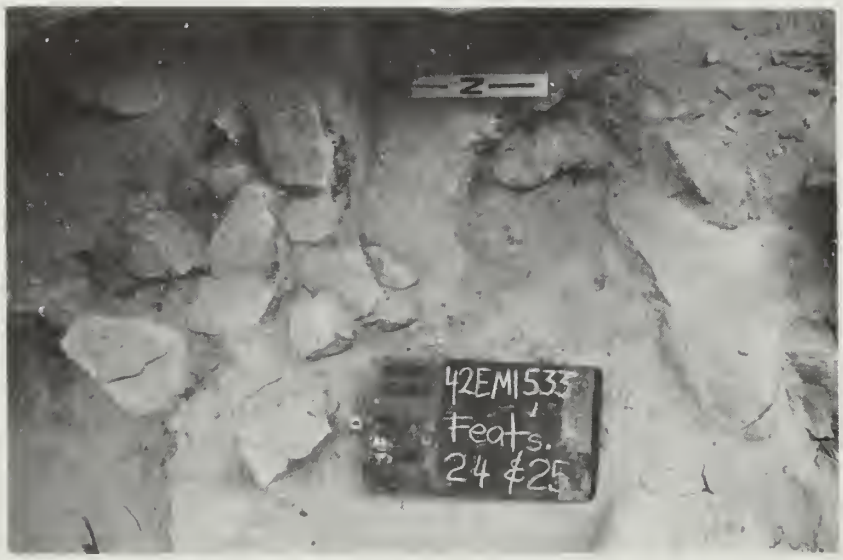


Figure 26. Plan and profile, Feature 24 and Plan, Feature 26.



a. Feature 24, cobble-filled hearth, prior to removal of charcoal and sandstone chunks and slabs. Note depression between North arrow and photo board which held Feature 25 (basin-shaped hearth) and, in the extreme upper left corner, the slabs of Feature 26 (also a basin-shaped hearth).

b. Feature 24 after removal of fill. Note Feature 26 (on right of photograph) with slabs in place, encroaching on the edge of Feature 24.

PLATE 9

was a concentration of charcoal and ashy soil contained within a circular, heat-reddened basin which had been dug into the sandy silt below. The basin measured 30cm in diameter and up to 10cm in depth. It produced Radiocarbon Sample #79.

Feature 15

Another basin-shaped hearth, consisting of a 1 to 8cm-thick lens of charcoal and ash-stained soil resting within a shallow, roughly circular basin, was found in Overhang B at a depth of 65 to 74cm below pgs. Situated in Grid Units 15N19W and 16N19W, Feature 15 measured approximately 45cm in maximum diameter and up to 9cm in depth. The sandy silt into which the feature had been dug was heat-reddened up to 5cm away from the base and steeply-sloping walls of the pit. Radiocarbon Sample #98 was collected from Feature 15.

Feature 24

A large, shallow pit filled with dense charcoal mixed with numerous chunks and spalls of fire-reddened sandstone near the north end of The Hallway was designated as Feature 24 (see Figure 26 and Plates 9a and b). The feature was constructed during an occupation at the Level III-IV Contact (see section on Stratigraphy) and was dug into the cultural deposits of Level IV. Situated at Grid Coordinate 12N17W at a depth of 34 to 48cm below pgs, the feature measured up to 55cm in diameter and 15cm deep. Roughly 40 fragments of sandstone ranging in size from under 5cm in diameter to slabs over 20cm in diameter were contained in the pit. All were heat-reddened and nearly all lay on top of, or within, dense pockets of charcoal (very few actually rested on the bottom of the pit). Six of the larger slabs on the west, south, and southeast edges of the feature sloped slightly inward toward the center; however, these also rested atop charcoal fill. It appears that the stones were placed into and on top of the hot coals in order to retain the heat in the pit, to cook on top of them (as a "griddle"), or to heat the stones themselves for use elsewhere.

Flotation Samples #26 and #27 were collected from within the feature fill. Radiocarbon Samples #127, #135, #141, and #142 were also collected. Sample #142 produced a date of 3630 ± 80 B.P.

Stone Circle (Feature 6)

Near the northeast end of Test Trench 5 in the Osmond Overhang, resting atop the same sterile gravel level on which fire zones #14 and #22 were constructed, was Feature 6, a crude semicircle of angular cobbles ranging in size up to 25cm in diameter. The exterior diameter of the semicircle, north-south, measured 82cm. Although no evidence existed that this feature had ever

been used as a fire hearth (no heat-reddening of the stones or the underlying gravels, no ash or charcoal present within the semicircle), the interpretation of the stone arrangement as an artificial one is given credence by the fact that one of the stones was modified by man (metate fragment, #E305).

Projectile point #E285 and Feature 14 were situated immediately to the north and Feature 22 immediately east of this feature. Presumably, these artifacts are all contemporaneous, or nearly so. Feature 14 has been radiocarbon dated at 910 ± 50 B.P., a date compatible with artifact #E285, a Rose Springs Corner-notched point.

Slab-lined Cists

Of the 5 non-hearth, non-fire-related features found at Cedar Siding, the 2 most elaborately constructed were the slab-lined cists--Features 10 and 19. Due to the overall design of the structures (large, deep, and steep-walled) and the lack of evidence of in situ fires (unreddened slabs, unreddened surrounding fill, no apparent in situ charcoal), these two features have been interpreted as having been storage units as opposed to fire-containment structures.

Although very little remained to indicate what was actually stored in these cists, it can be postulated that they were constructed for protecting foodstuffs from rodents and other animals. Corn or other grains, seeds, and foodstuffs are known to have been stored in similar features (Jennings and Sammons-Lohse 1981:62). A high percentage of Pinus pollen was found in a flotation sample from Feature 10, possibly indicating that the cist was used for the storage of pinyon nuts.

Both features' fill was identical to the surrounding cultural fill; hence, it is not known whether the radiocarbon samples obtained from the features are contemporaneous or even associated. It is quite possible that the charcoal and wood used to date the cists had merely washed or blown in at a later date from outside proveniences.

Feature 10

The more southern of the 2 cists, Feature 10, was located in the South End of Overhang C (Grid Squares 5N16W and 5N17W). The upper edges of the upright slabs of the feature were from 6 to 9cm below pgs. Five major sandstone slabs (ranging in size from 27 x 17 x 2cm to 58 x 55 x 3cm) lined the walls of a pit which had been excavated into the surrounding cultural fill (see Figure 27 and Plates 10a and b). Four additional slabs stood in the southwest corner of the cist, behind the interior wall slabs of the feature. Apparently, the cist was originally larger and was later made smaller in this corner via clay mortar, sandstone chinking, and the erection of an interior wall of upright slabs. Feature 10 measured up to 58cm in interior diameter at the top, 38cm in diameter at the base, and up to 40cm in depth.

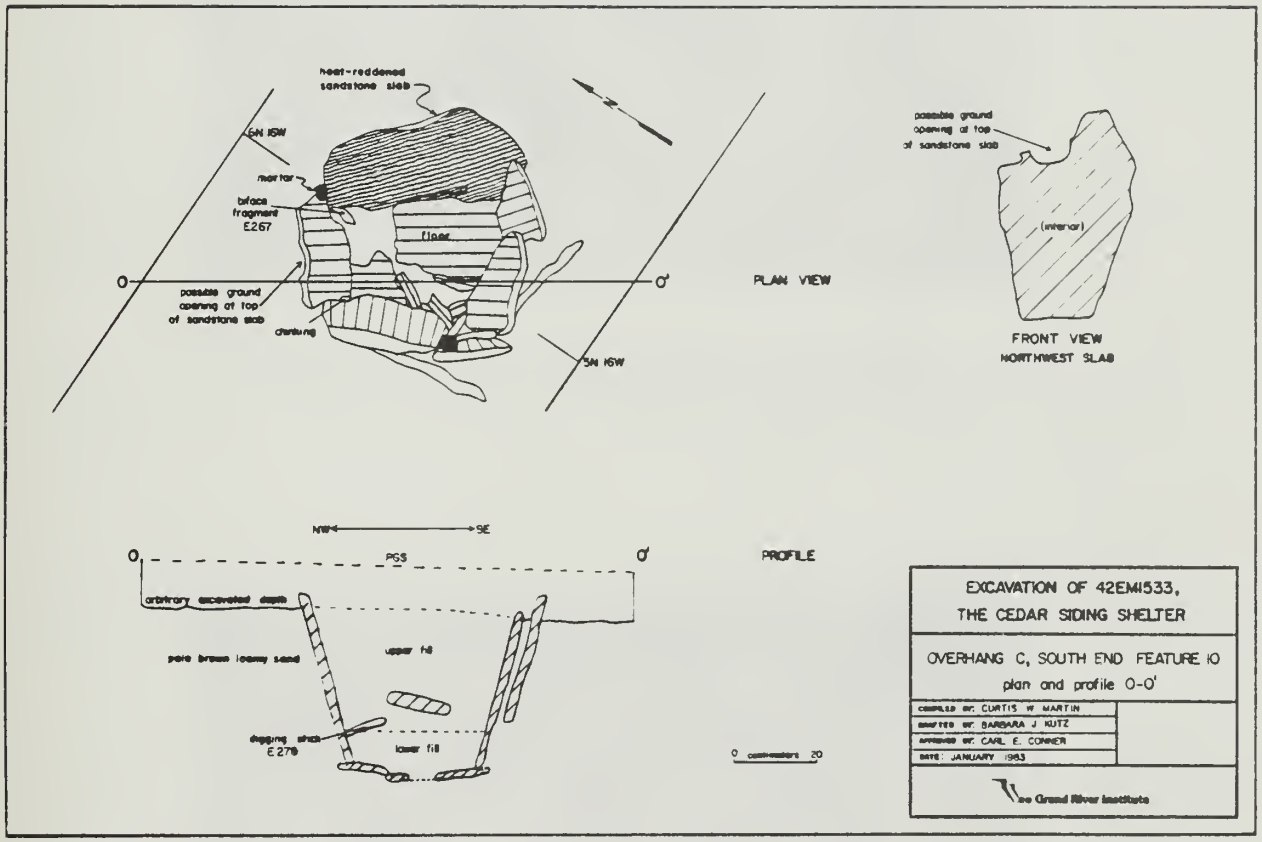


Figure 27. Plan and profile O-O', Feature 10, Overhang C.

a. Feature 10, slab-lined storage cist, partially excavated. Note sandstone slab and both fragments of digging stick (#E278) within cist.

b. Feature 10 after removal of fill.

PLATE 10

The slab which formed the northwest wall of the cist had an unusual semi-circular notch formed in its upper edge. Although no definite indications of intentional shaping or grinding occur on this notch, it did not appear to be a natural formation. Apparently the upper portion of the sandstone slab, adjacent to the notch, was missing; quite likely, it originally formed a complete circular opening. (Even if the opening were naturally occurring in the slab, it is evident that the piece of sandstone was selected and built into the cist with this characteristic in mind.) Although similar examples could not be found in the literature of the area, this opening (which measured 8.5cm in diameter) could have been used as an orifice for adding to or removing the cist's contents, obviating the removal of the lid from the storage unit (assuming that one existed). If a sandstone lid was mortared into place atop the walls of the feature, a small opening such as this would greatly simplify access to the foodstuffs (or whatever) within.

The floor of Feature 10 was lined with 6 sandstone slabs--3 of which were heat-reddened, presumably from former use in hearths. This floor (which sloped slightly toward the center) extended up to 10cm beyond the interior surfaces of the upright wall slabs.

In several places on the walls of the feature, remnants of mud mortar used to seal and strengthen the cist still clung to the slabs. In addition, several spalls of sandstone and quartzite had been wedged between the slabs to act as chinking. Two of these spalls (#E267 and #E180), which were adjacent to and immediately behind Slab #9, were large quartzite biface fragments.

The feature fill was excavated by halves. No stratigraphic variation existed in the fill, which consisted of very dry, ashy, pale brown loamy sand with occasional flecks and chunks of charcoal. At a depth of approximately 30cm below the top of the feature, a layer of bluegrass (Poa) florets was contacted. This probably represents the remains of a recent rodent nest.

Even though it was apparent that the feature fill had been washed in from the surrounding area, Flotation Samples #6 through #8 and Radiocarbon Samples #65 and #67 through #69 were collected from within the cist. Radiocarbon Sample #67, from the lower portion of the fill, produced a Fremontage date of 1220 ± 70 B.P. A large chunk of charcoal recovered from directly beneath one of the floor slabs of the Feature (C-14 Sample #109) produced a date of 2190 ± 60 B.P. The flotation samples produced unburnt bluegrass (Poa), cactus, juniper, and Indian ricegrass seeds and burnt juniper and sunflower (Helianthus) seeds. Pinus pollen (presumably pinyon) was found to be 14 percentage points more abundant in this sample than in the sample displaying the next largest frequency--possibly reflecting the storage of pinyon nuts in this feature.

Also resting in the fill near the floor of the cist were two fragments of a 90.6cm-long hardwood stick (apparently of squawbush) and an unmodified sandstone block. The stick (Artifact #E278) has been rounded and blunted through use at both ends and broken near the middle. It has been analyzed as a "digging or walking stick", although the exact nature of the use to which it was put can only be speculated upon. The rounded end of one of the fragments is also slightly charred as if it had been fire-hardened or perhaps used

as a fire poker. The 2-piece stick was collected as a potential radiocarbon sample (wrapped in aluminum foil) and remains suitable for dating.

Feature 19

The other slab-lined cist at Cedar Siding Shelter was Feature 19, located in Grid 9N17W, Overhang C, Hallway, 1.5m north of Feature 10. The construction of this cist was very similar to that of Feature 10 (see Figure 28 and Plates 11a and b).

The upper edges of the upright wall slabs (all but one appeared to have been partially broken off) were from 2.5 to 19cm below pgs. The roughly rectangular cist measured 52cm northwest-southeast, 43cm northeast-southeast, and up to 37cm deep. The 6 slabs which formed the walls of the feature were vertical or nearly so and ranged in size from 12cm across to 50 x 27 x 5cm. None of the slabs was reddened. The upper portion of the southwest wall slab was found lying in the fill approximately 15 to 20cm outside of the cist. The feature was partially filled with jumbled sandstone slabs and slab pieces (up to 40cm across), quite possibly the fragmented remains of a cover of the storage unit.

As in Feature 10, mud mortar had been used in the construction of the cist, and significant portions of it remained in situ, especially along the southern and western walls. The floor of Feature 19 was formed by the sandstone bedrock beneath. A crude, oblong depression or shelf measuring roughly 50cm in diameter had been chipped or pecked into the soft bedrock to a depth of 9 to 10cm in order to form a more level base for the storage unit.

As mentioned earlier, the fill within the feature was virtually identical to the surrounding ashy, pale brown loamy sand and is not considered to have been in situ in any way. Radiocarbon Sample #110 was obtained from within the cist and consisted of a partially burnt fragment of juniper wood; it produced a date of 2060 ± 60 B.P. (ca. 110 B.C.). An additional C-14 sample (#111) was also collected but remains unanalyzed.

Analysis of Flotation Samples #12 through #14, taken from the feature fill, revealed unburnt juniper, pinyon, saltbush, cactus, and Indian ricegrass and burnt sunflower seeds.

Dry Laid Masonry Wall (Feature 28)

What was apparently a dry-laid, semicircular masonry wall (Feature 28) spanned the eastern end of Overhang B (see Figure 29 and Plate 12a). The upper surface of this stone alignment was visible on the existing ground surface prior to excavation, and a jumbled concentration of unmodified sandstone cobbles and small boulders continued to a depth of up to approximately 75cm (although a vast majority of the stones existed in the upper 40cm of fill). Measuring roughly 6m in length north-south, the wall extended from a sandstone

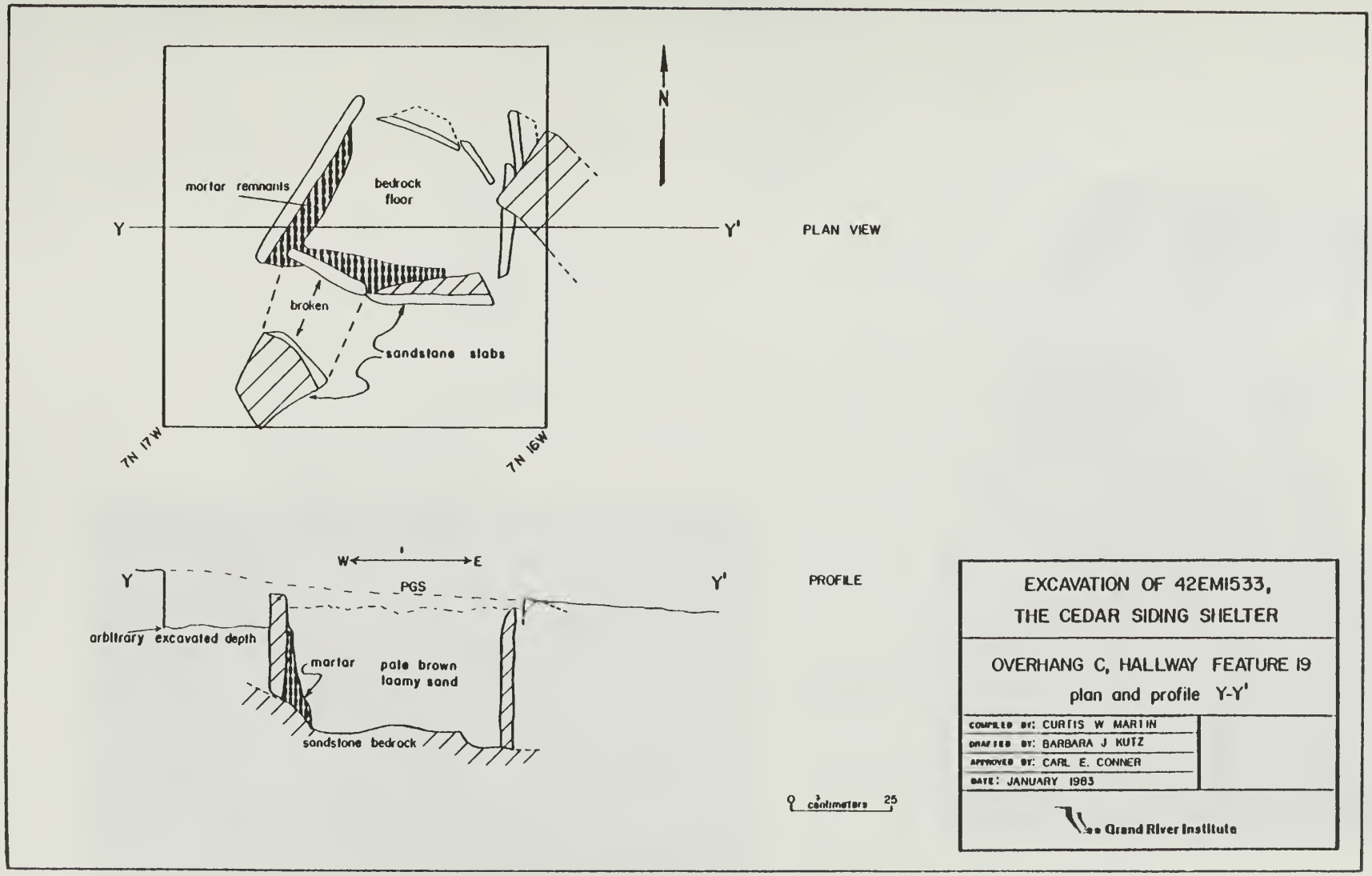


Figure 28. Plan and profile, Feature 19, Overhang C.

a. Feature 19, slab-linedstorage cist, after excavation of fill. The upper portion of the upright slab in the southwest corner has been placed in its original position for the photograph.

b. Mortar sample remaining in situ in the southwest corner of Feature 19. The upper portion of the slab on which the scale and pencil rest was found outside the feature.

PLATE 11

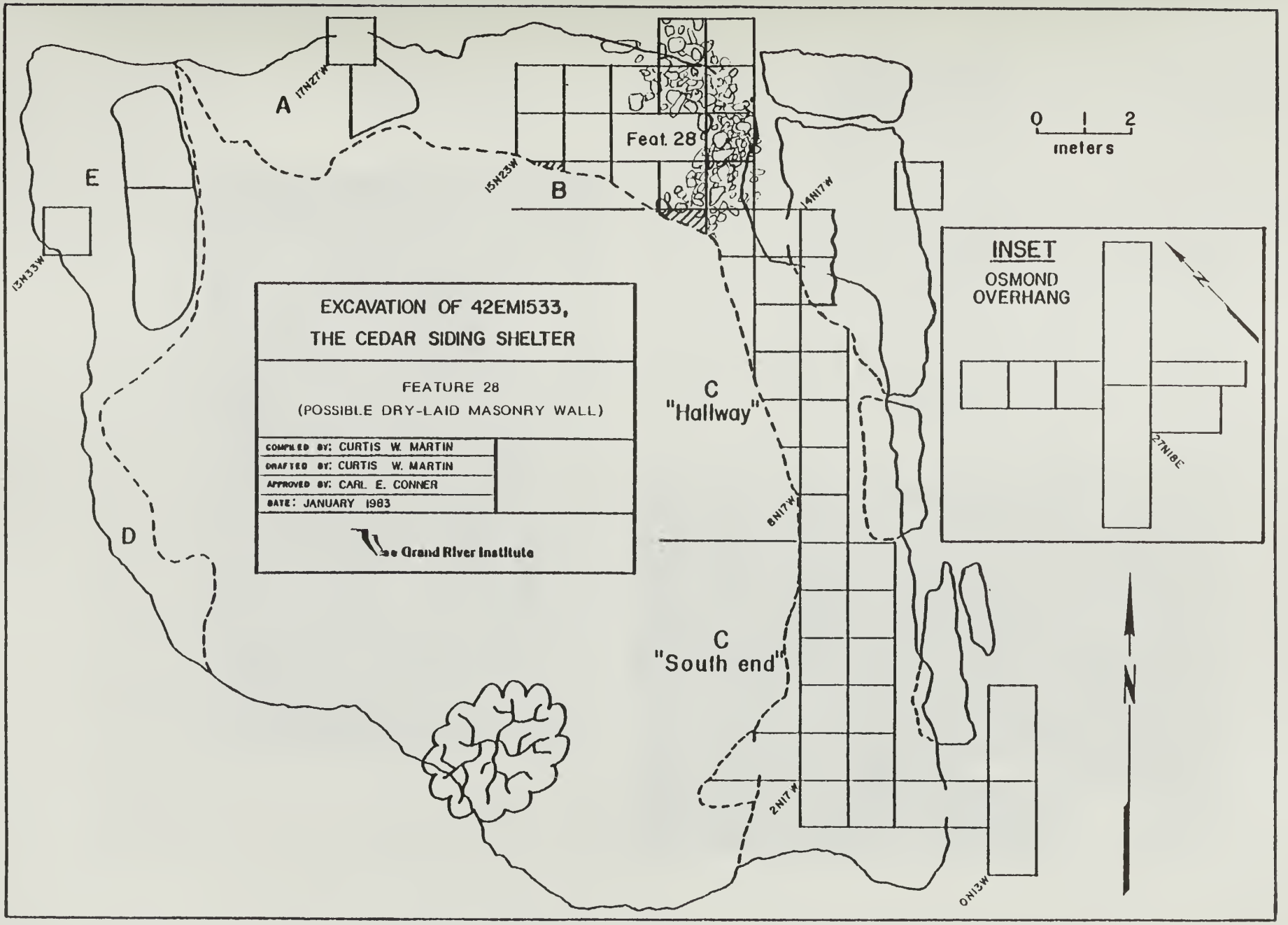
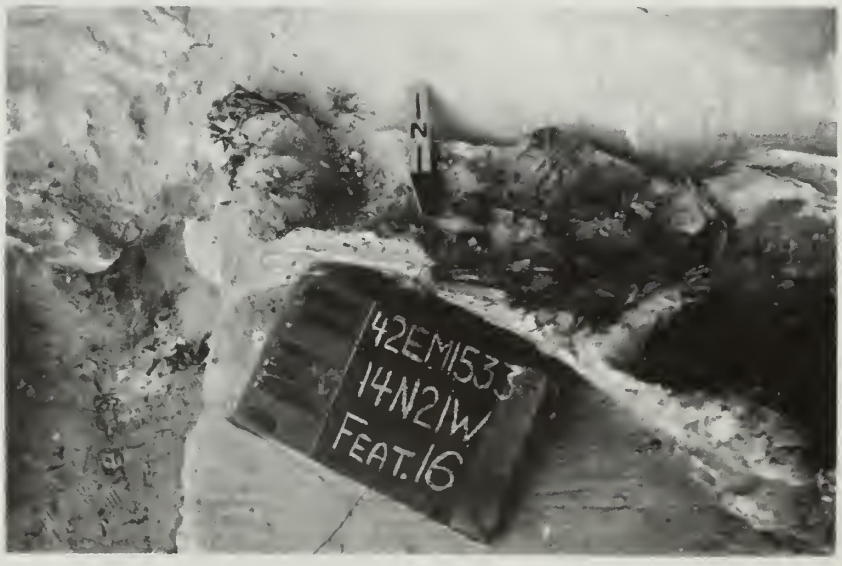


Figure 29. Plan view of possible dry-laid masonry wall, Feature 28, extending north-south through eastern portion of Overhang B.

a. A portion of Feature 28, a possible dry-laid masonry wall (collapsed), is visible on the surface and within the fill at the top of the photograph. Foreground, where Feature 7 (slab-lined fire hearth) is exposed, and distance (Grid Unit 15N19W) have been cleared to 40cm level. Center (E½ of Test Trench 4) is cleared to bedrock.



b. Feature 16, juniper bark mat, resting atop layer of leached alkali salts in Grid Unit 14N21W.

ledge at the mouth of Overhang B to the back wall of the shelter. It was constructed of stones ranging in size from under 15cm to over 50cm in diameter. It seems that the now-collapsed wall probably was associated with the presumed living surface at the 38 to 40cm level in Overhang B, or a slightly lower occupation.

Juniper Bark Mat (Feature 16)

Several pieces of juniper bark were found in the cultural fill at Cedar Siding Shelter--in Overhangs B and C. By and large, it is impossible to ascertain whether these fragments were transported into the shelter by man, rodents or other animals, or other agents. One concentration of juniper bark, however, Feature 16, was so large and densely packed that it left little doubt that it has been collected and placed there by humans (see Figures 16 and 21 and Plate 12b). This bed or mat of bark lay primarily in Grid Square 14N21W, against the back wall of Overhang B, at a depth of 17 to 40cm below pgs. It was situated directly on top of a leached alkali salts layer which seems to have formed a crevice in the cultural fill after deposition.

Feature 16 measured approximately 105cm northwest-southeast by 45cm northeast-southwest, and at no place was it greater than 15cm in thickness. The juniper bark was somewhat decomposed and it was impossible to determine whether the mat had been woven, braided, or otherwise intentionally arranged. A large sample portion of the mat was collected in aluminum foil as Radiocarbon Samples #100 and #102, but it remains unanalyzed.

Grass Mat (Feature 18)

A small, roughly circular pad of dried grass was found in the balk at Grid Coordinate 3N16W in the South End of Overhang C. The mat (Feature 18) measured approximately 23cm in diameter and up to 3cm thick and was situated from 6 to 14cm below pgs (See Figure 7). Although no direct evidence of a rodent burrow remained adjacent to Feature 18, this grass mat was very similar to other "beds" of vegetable material found in abandoned krotovina at Cedar Siding, and most likely it, too, is the result of rodent activity.

Bighorn Sheep Pictographs

Although not assigned a formal feature number, two red pictographs of quadrupeds, apparently bighorn sheep, are painted on the back wall of the shelter in Overhang C, South End, approximately 1.5m above the present ground surface of Grid Square 3N18W (see Plates 13a and b). Each figure faces west (left) and measures 18cm long by 10 to 13cm high. The figures are approximately 45cm apart. A vandal's name has been written (in charcoal ?) across the figure to the west. A spall of sandstone has fallen from the head of this

a. One of two bighorn sheep pictographs painted in red pigment on the back wall of Overhang C, South End.

b. The second of two bighorn sheep pictographs painted in red pigment on the back wall of Overhang C, South End. (Lies to east of figure shown above.)

PLATE 13

figure (which presumably was originally solid pigment as the rest of the body is). The other pictograph is quite faded and a spall has fallen off near its hindquarters.

Of the quadrupeds represented in western prehistoric rock art, the bighorn sheep appears most frequently. In a sample of 85 rock art sites of the Northern San Rafael Fremont style, 43% of the quadrupeds are bighorn sheep, 28% are deer and elk, 3% are bison, 4% are unidentified cloven-hoofed, and 22% are unidentified (Schaafsma 1971:154).

While bighorn sheep do not currently inhabit the project area, two nasal bone fragments from the Cedar Siding Shelter were identified as bighorn. Faunal evidence from Paradox Valley (approximately 110 miles southeast of Cedar Siding) suggests that bighorns

> ...were the most frequently exploited large game animals during the Fremont occupation...hunting forays were made to the nearby LaSal Mountains, and ... this animal became an increasingly important large game food source through the Fremont sequence...(Hibbets et al. 1979:III-63, 68).

While it is not known by whom the pictographs at Cedar Siding were executed, it is probable that they are attributable to a Fremont (or earlier) artist. The nasal bones mentioned above were found in Cultural Level I of the Osmond Overhang--a single component Fremont level.

DIAGNOSTIC ARTIFACTS ANALYSIS

Projectile Points

A total of 10 classifiable projectile points were recovered from the Cedar Siding Shelter project. These are specimens with the hafting element intact, or enough of it present to infer its form prior to breakage. A number of those specimens that have been inventoried as merely "biface fragments" are quite possibly projectile point tips and midsections in which the diagnostic hafting element is missing.

The 10 specimens have been grouped into six types according to formal, or morphological, similarity. These types, where possible, have then been compared to projectile points from other archaeological studies in the region to which relative and absolute chronologies have been applied. Several primary sources are referenced due to the general geographic proximity of their materials to the Cedar Siding Shelter study area and the extent of the temporal span covered by their projectile point typologies: Black, et al., 1981, An Archaeological Survey of the Central Lisbon Valley Study Tract in the Moab District, San Juan County, Utah; D. Madsen, 1979a, Prehistoric Occupation Patterns, Subsistence Adaptations, and Chronology in the Fish Springs Area, Utah; Lindsay, 1977, An Archaeological Survey of Clay Basin, Daggett County, Utah; and Jennings, 1980, Cowboy Cave.

The six point types have been arranged roughly according to chronology, from the earliest to the most recent. Photographs of the projectile points appear in Plate 14.

The morphological descriptions represent a simplified and somewhat modified version of an attribute list presented by Binford (1963:193-221). Detailed definitions of the terminology used may be found in this reference.

The "associated radiocarbon dates" referred to were processed by Beta Analytic, Inc. of Coral Gables, Florida.

Sudden Side-Notched
(1 specimen: #E281; see Plate 14j)

Blade Outline: Sub-triangular
Transverse Cross Section: Lenticular
Blade Symmetry: Asymmetrical ?
Flaking: Bifacial primary scars and unifacial secondary scars to form notches on each edge
Base Outline: Flat to slightly convex
Haft Element: High side-notches
Shoulders: Obtuse

Projectile Points, Cedar Siding Shelter

a) Cottonwood Triangular (E195), b) Rose Springs Corner-Notched (E285), c) Rose Springs Corner-Notched (E286), d) Elko Side-Notched (E287), e) Elko Series (E288), f) Elko Series (E134), g) Elko Series (E136), h) Large Corner-Notched Point (E283), i) Gypsum (E282), j) Sudden Side-Notched (E281).

PLATE 14

Measurements:
Length: 3.7+cm
Width: 2.0cm
Thickness: 0.6cm
Distribution at Cedar Siding Shelter: Overhang C, Hallway, 11N17W, Level IV
Associated Radiocarbon Dates: Sample 42EM1533 #124 (3710 ± 90 B.P.), Feature 23, Sample 42EM1533 #144 (3740 ± 70 B.P.), and Feature 23, Sample 42EM1533 #145 (4100 ± 70 B.P.), and possibly other dates at Cedar Siding
Comparisons: Jennings et al. (1980:82) Sudden Side-Notched, 6500-4600 B.P.; Pierson (1980:100) Sudden Side-Notched, Early Archaic 6050-4550 B.C.; Buckles (1971:147) Type 37, Early Archaic; Lister (1951:18-19, 39-40) similar point found in early stratigraphic position at Hell's Midden
Temporal Span and Cultural Affiliation: 8050-4600 B.P. Early to Middle Archaic (Black Knoll through Castle Valley Phases--primarily found in the earlier contexts)

Gypsum
(1 specimen: #E282; see Plate 14i)

Blade Outline: Leaf-shaped
Transverse Cross Section: Lenticular
Blade Symmetry: Symmetrical
Flaking: Bifacial primary scars overall, continuous bifacial secondary scars (serration) on one edge, and discontinuous unifacial scars on opposite edge
Base Outline: Convex
Haft Element: Corner-notches
Shoulders: Very slightly barbed
Measurements:
Length: 5.8cm
Width: 2.6cm
Thickness: 0.5cm
Distribution at Cedar Siding Shelter: Overhang C, Hallway, Level III-IV Contact (49cm)
Associated Radiocarbon Dates: Feature 25, Sample 42EM1533 #131 (2820 ± 60 B.P.), Feature 24, Sample 42EM1533 #142 (3630 ± 80 B.P.), and possibly other early dates at Cedar Siding
Comparisons: Buckles (1971:149) Type 32, 6500-3500 B.C.; Jennings (1980:37) Gypsum, 4600-1600 B.P.; Pierson (1980:31) La Sal Complex, Archaic; Jennings, et al. (1980:81) Gypsum, 4600-3300 B.P.
Temporal Span and Cultural Affiliations: 8500-1600 B.P. Early to Late Archaic (Black Knoll through Dirty Devil Phases)

Elko Series
(4 specimens: #E287, #E288, #E134, #E136; see Plate 14, d-g)

Blade Outline: Sub-triangular
Transverse Cross Section: Lenticular and plano-convex

Blade Symmetry: Indeterminate
Flaking: Bifacial primary scars and bifacial secondary scars, particularly along base edges (one specimen exhibits unifacial attrition along base)
Base Outline: Flat, slightly convex
Haft Element: Indeterminate and low side-notches
Shoulders: Rounded
Measurements:
Maximum Length: 1.9+cm
Maximum Width: 1.9+cm
Maximum Thickness: 0.4cm
Distribution at Cedar Siding Shelter: Overhang B, Test Trench 4, 30-40cm; 14N22W, 0-10cm; 15N21W, 54cm; and Overhang C, South End, Test Trench 2, 0-20cm
Associated Radiocarbon Dates: Sample 42EM1533 #83 (2870 ± 100 B.P.), Sample 42EM1533 #32 (1980 ± 100 B.P.), Sample 42EM1533 #114 (1570 ± 60 B.P.), and possibly other dates at Cedar Siding
Comparisons: Jennings (1980:37) Elko series, 8000-1500 B.P.; D. Madsen (1979a: 48) Elko side-notched, Archaic, but also recovered in Paiute-Shoshoni contexts (neither chronologically nor culturally diagnostic); Black et al. (1981:104-108) Elko series, 7600-1000 B.P. (from Holmer 1978), Archaic and Fremont (from Madsen and Berry 1975, and Holmer 1978); Jennings et al. (1980:81) Elko series, 7600-5300 B.P.
Temporal Span and Cultural Affiliations: 8000-400 (?) B.P. Typically affiliated with the Archaic culture (Black Knoll through Dirty Devil Phases); however, also found in Fremont and Paiute-Shoshoni sites

Large Corner-Notched Point With Nearly Parallel Sides
(1 specimen: #E283; see Plate 14h)

Blade Outline: Triangular (?)
Transverse Cross Section: Lenticular
Blade Symmetry: Symmetrical
Flaking: Bifacial primary scars, unifacial secondary scars (edge rounding on both edges)
Base Outline: Indeterminate (haft snap, base missing)
Haft Element: Corner-notches
Shoulders: Barbed
Measurements:
Length: 3.5+cm
Width: 3.4cm
Thickness: 0.5cm
Distribution at Cedar Siding Shelter: Overhang C, South End, 21N17W, 20-25cm
Associated Radiocarbon Dates: Possibly some of the Archaic dates at Cedar Siding
Comparisons: Anderson and Higel in Breternitz (1970:97, 98, 101) Type 2B, pre-horticultural stage; Buckles (1971:127, 143) 2500-2000 B.P.
Temporal Span and Cultural Affiliations: 2500-2000 B.P. (?) Late Archaic (Dirty Devil Phase), possibly a hafted knife from a later occupation

Rose Springs Corner-Notched
(2 specimens: #E285 and #E286; see Plate 14, b and c)

Blade Outline: Leaf
Transverse Cross Section: Convex-triangular and plano-convex
Blade Symmetry: Symmetrical and indeterminate
Flaking: Bifacial primary scars and bifacial secondary scars--unifacial attrition; other is unthinned flake with bifacial secondary retouch to shape
Base Outline: Flat to slightly convex
Haft Element: Corner-notches
Shoulders: Barbed
Measurements:
Maximum Length: 3.5cm
Maximum Width: 1.5cm
Maximum Thickness: 0.4cm
Distribution at Cedar Siding Shelter: Osmond Overhang, Test Trench 5, 85cm and; Overhang C, South End, Test Trench 1, 10cm
Associated Radiocarbon Dates: Sample 42EM1533 #114 (1570 ± 60 B.P.), Sample 42EM1533 #94 (910 ± 50 B.P.), and possibly other dates at Cedar Siding
Comparisons: Black et al. (1981:108) Rose Springs Corner-notched, A.D. 500-900; Jennings (1980:32-37) 1600-1525 B.P.; D. Madsen (1979a:18) Rose Springs Corner-notched, post-date A.D. 300; Lindsay (1977:28) Fremont and Paiute-Shoshoni contexts; Hibbets et al. (1979:53) early post-Archaic, 400-900 A.D.; Holmer and Weder (1980:59) Rose Springs point, occurs in early Fremont sites
Temporal Span and Cultural Affiliations: 1650-550 B.P. Late Dirty Devil Phase (Late Archaic), Fremont, Paiute-Shoshoni (early)--although most often associated with Fremont contexts

Cottonwood Triangular
(1 specimen: #E195; see Plate 14a)

Blade Outline: Sub-triangular
Transverse Cross Section: Plano-convex
Blade Symmetry: Indeterminate
Flaking: Bifacial parallel primary scars
Base Outline: Slightly concave
Haft Element: Unnotched
Shoulders: None
Measurements:
Length: 1.3+cm
Width: 1.5cm
Thickness: 0.2cm
Distribution at Cedar Siding Shelter: Overhang C, South End, 5N16W, 20-30cm
Associated Radiocarbon Dates: Possibly some of the later dates at Cedar Siding

Comparisons: D. Madsen (1979a:19) Cottonwood Triangular, post-Archaic (possibly arrowhead preforms); Jennings (1978:63) Cottonwood Triangular, post-4000 B.P.; Hibbets et al. (1979:69) small triangular unnotched points from sites which demonstrate "diverse temporal comparisons"

Temporal Span and Cultural Affiliations: 4000 B.P.-? Late Archaic through post-Archaic (Green River and Dirty Devil Phases to...?) May be arrowhead blanks or bifaces used as knives or scrapers

Pottery

A total of four ceramic fragments were recovered from 42EM1533 (see Plate 15). All were surface finds from Locus II. Size ranged from 1.4 x 1.3 x 0.5cm to 4.4 x 4.0 x 0.84cm. The fragments have similar tempers which consist of basalt and quartz. Finishes are smooth and striations are present on most of the interior surfaces. Fire clouds are occasionally present on both surfaces. The sherds are apparently Emery Gray, which is present throughout the San Rafael Fremont area and dates from approximately A.D. 700-1200 (R. Madsen 1977:31). Although the fragments vary in thickness, it is quite possible they were part of a single vessel.

Pottery Sherds, Cedar Siding Shelter, Locus II Surface
a) S539, b) S540, c) S537, d)S596

PLATE 15

NON-DIAGNOSTIC ARTIFACTS ANALYSIS

Bifaces

A total of 88 chipped stone bifaces and biface fragments were collected, 84 from within the Cedar Rock Shelters, 2 from Locus I Surface and 2 from Locus II Surface (see Plate 16). Because of their predominance in Overhang B and the northern portion of Overhang C, Hallway, the distributional analysis which follows deals only with the totals for bifaces located in Overhangs B and C (the primary areas of excavation), where 83 specimens were found.

Of the fragmentary bifaces from Overhangs B and C, 28 are tips, 6 are midsections, and 25 are bases. One of the tips, 1 midsection, and 4 bases give the appearance of being possible projectile point fragments. Three of the bases are triangular in shape, 8 are sub-triangular, 2 are ovate, 8 are leaf-shaped, 2 are rectilinear, and 2 are irregular.

Twenty-four of the bifaces from these shelters are complete. Size ranges from 3.9 x 2.8 x 0.7cm to 18.2 x 4.3 x 22cm. The largest biface, #E267, a crude unutilized tool of quartzite, had been incorporated as chinking between the wall slabs of Feature 10, Overhang C, South End (see Feature Descriptions).

Wear pattern analysis showed 57% of the bifaces exhibiting attrition, 14% edge rounding, 2% edge crushing, and 27% step fractures. Distribution of wear was as follows:

Attrition:	39% in Overhang B 48% in Overhang C, Hallway 12% in Overhang C, South End
Edge Rounding:	64% in Overhang B 37% in Overhang C, Hallway
Edge Crushing:	100% in Overhang B (one specimen)
Step Fractures:	38% in Overhang B 62% in Overhang C, Hallway

Of the 58 separate incidences of wear observed on the bifaces, 43% were in Overhang B, 50% in Overhang C, Hallway, and 7% in Overhang C, South End.

A spatial analysis of the wear patterns observed on these tools appears to indicate a non-random distribution of the edge rounding attribute. Of the 8 specimens exhibiting this trait, 5 were located in Overhang B (63%). The small number of specimens involved, however, makes it difficult to statistically validate the non-random distribution.

Also, a notable percentage (89%) of the biface tips occurred north of the 12N line. In contrast, only 68% of the debitage occurred in the same area. The biface bases, conversely, were clustered south of the 13N line, 60% in that location compared with 40% of the debitage. In other words, a greater than expected number of biface tips were found in the northern portion of the

Bifaces, Cedar Siding Shelter

Top row: reconstructed specimens a) E228 and E300, b) E256 and E44, c) E271 and E230, d) E251 and E122. Bottom row: representative sample of biface shapes e) E270--rectilinear, f) E209--ovate, g) E220--sub-triangular, h) E257--leaf-shaped, i) E213--triangular.

PLATE 16

rockshelter, while a high percentage of the bases were located farther south, primarily in the north end of Overhang C, Hallway. This dichotomy appears to indicate that similar activity areas existed, through time, in the Cedar Rockshelters (see Conclusions and Archaeological Interpretations).

Forty-nine biface bases and whole specimens were identifiable as to overall shape, breaking down as: 31% leaf-shaped; 27% sub-triangular; 18% ovate; 12% rectilinear; 6% triangular; and 6% irregular. The remaining specimens were unclassifiable.

Four biface bases were found to fit with three tips and a midsection, forming four complete, or nearly complete, specimens (see Plate 16, a-d). Two of these reconstructed specimens are composed of fragments located in similar proveniences and levels in Overhangs B and C (see Figure 30). The remaining two (from Overhang B) were located in the same or adjacent grids, but the fragments varied in depth; a midsection (#E271) found from 0-10cm fit a base (#E230) found from 20-30cm, and a tip (#E228) located from 30-40cm matched a base (#300) found from 70-80cm. This apparently indicates significant mixing of sediments in Overhang B and/or examples of collection and re-use of tool fragments by later peoples.

Perforators

Three perforators, or "drills," were found at Cedar Siding Shelter, 2 in Overhang B, and 1 in Overhang C, South End (see Plate 17). They are characterized by having a narrow blade or tip with a triangular transverse cross-section.

Specimen #E277 is a formally shaped tool with a finely retouched elongated point and expanded base, possibly indicating hafting. The blade has a triangular transverse cross section with a medial ridge on one face (creating a somewhat diamond-shaped cross section). Unifacial attrition on all three edges indicates a counterclockwise rotation during the forceful gouge. It measures 4.1 x 1.4 x 0.6cm.

Another perforator, #E238, is a finely worked biface having a short point and showing extremely light attrition. This specimen measures 3.3 x 1.2 x 0.4cm.

Specimen #E194 is a chert chunk with a naturally shaped triangular point. Unifacial attrition on all three edges also indicates use in a counterclockwise direction. It measures 3.5 x 1.0 x 1.0cm.

Unifaces

A total of 8 unifaces were located. Two were found on the surface of Locus I, 2 on the surface of Locus II, 1 in Overhang B, 2 in Overhang C,

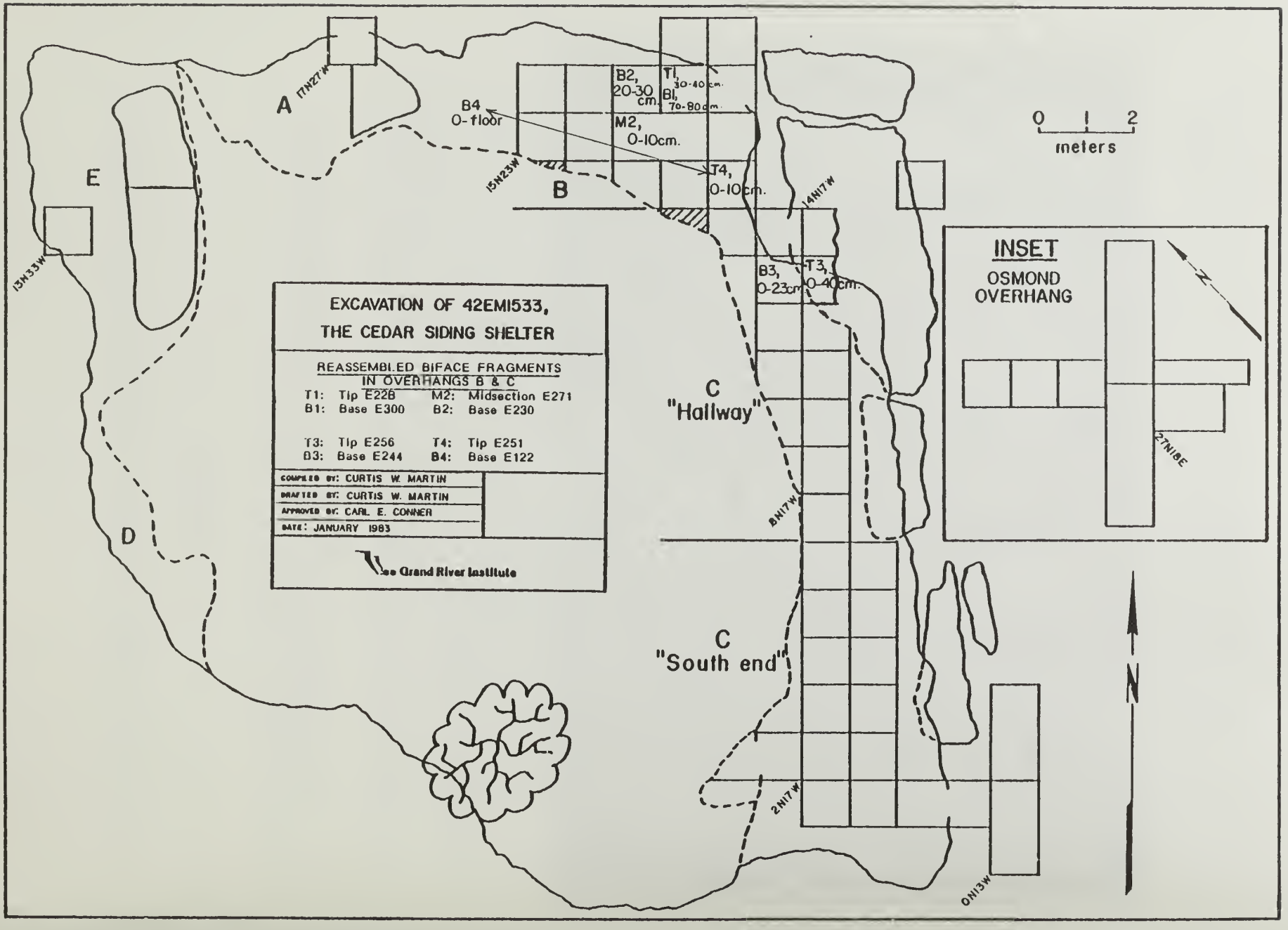


Figure 30. Plan view of Cedar Siding Shelter showing locations of reassembled biface fragments in Overhangs B and C.

Perforators, Cedar Siding Shelter, Overhangs B and C
a) E277, b) E194, c) E258

PLATE 17

Hallway, and 1 in Overhang C, South End. Three of the specimens are unutilized, 3 exhibit attrition, and 3 exhibit step fractures.

A spatial analysis of the wear patterns on these tools failed to indicate any non-random distribution of these attributes. Measurements range from 3.5 x 2.1 x 0.5cm to 9.6 x 4.7 x 2.6cm.

Cores, Core Tools, and Hammerstones

Fifty-six cores, core tools, and hammerstones were located at Cedar Siding Shelter. Nineteen of the specimens are unutilized, 18 had been used as choppers (7 of these were tools intentionally shaped for that purpose), 7 were utilized for other purposes, and 12 are hammerstones.

The cores and core tools (including the choppers) were divided into core types, defined as follows: (1) tabular uni-directional--a type with the appearance of a tablet showing that flakes were removed from one platform surface and in only one direction; (2) tabular bi-directional--a core type with the appearance of a tablet exhibiting scars resulting from flakes having been removed from two directions; (3) conical--a core type resembling a cone; (4) bi-conical--a core type resembling two cones joined together with apices at each end; (5) discoidal--a bi-convex core resulting from having flakes removed from the perimeter; and (6) irregular--a core having flakes removed randomly (Crabtree 1972).

Sixty-nine percent of the cores are irregular, 9% are bi-conical, 7% are conical, 7% are tabular, uni-directional, 4% are discoidal, and 4% are tabular, bi-directional.

Debitage

A total of 14,947 waste flakes and chunks of angular shatter were collected during the project. Because of the large number and variety of specimens involved, and the relatively small number of formal tools at Cedar Siding Shelter, these items have formed the basis of the distributional analysis and activity area studies in this report (see section entitled Conclusions and Archaeological Interpretations).

A number of "tools" (92 in all) in the form of flakes and chunks modified through use were a part of this inventory, as well as two special categories of debitage: biface thinning flakes (81 specimens) and flakes with 3 or more parallel dorsal flake scars (58 specimens).

Groundstone

A total of 16 metates and metate fragments, 1 lap anvil, and 10 manos and mano fragments were recovered from Cedar Siding Shelter. All specimens are of sandstone.

The lap anvil (#E301) is a slab exhibiting moderate pecking but no evidence of grinding; it may be a metate blank. The metates and metate fragments show 14 occurrences of grinding and 2 of pecking to shape the specimens. Of those large enough to type, 7 are slab and 2 are basin-shaped.

Of the manos and mano fragments (see Plate 18), 2 are unifacial, 5 are bifacial, and 3 are indeterminate. There are 9 incidences of grinding and 2 of pecking to shape the manos. Shape distribution is as follows: 5 sub-rectangular, 3 ovoid/round, and 2 indeterminate.

Miscellaneous Artifacts

Miscellaneous artifacts include a possible digging stick/walking/fire poker, a worked porcupine incisor, an artiodactyl incisor pendant, a worked cottontail long bone, a worked mammal bone, and a small, naturally shaped stone ball.

The "digging stick", #E278, consists of a branch of squawbush (Rhus trilobata) broken roughly in half (see Plate 19). It was found resting within Feature 10, a slab-lined cist. One utilized end is rounded, either intentionally or possibly through use as a digging stick. This end has also been charred, suggesting its utilization as a fire poker. The opposite end has been worn, perhaps through use as a digging or walking stick (the wear here is flatter than on the opposite end). A sandstone slab was lying on one of the fragments, indicating it may have fallen or been thrown on top of the stick as it was lying across the opening of the cist, breaking it in two.

A fragment of an incisor of a porcupine (Erethizon dorsatum) was recovered from the upper 20cm of fill within a slab-lined cist, Feature 10. The tooth (#E342) has been broken off near the root end and split lengthwise (see Plate 20). Both the broken end and the split surface have been moderately to highly polished and a series of diagonal striations is present on the split surface. The opposite end of the tooth has been drilled, beginning from both surfaces and meeting in the middle. Although this was apparently intended to form a complete circular hole (with a diameter of approximately 3mm), this end has also broken off leaving a semicircular notch in the end. It is plausible that the incisor was drilled to hang as a bead or pendant. The specimen measures 18.8mm long, 5.0mm in width, and 2.5mm thick.

The artiodactyl incisor (#E343)--quite likely from a mule deer or antelope--has a circular hole drilled through the proximal, or root, end (see Plate 20). Both ends of the specimen are broken and a few fine scratches occur on the anterior surface. The drilled hole measures 1.5mm in diameter and was presumably used to string the tooth as a pendant or bead. The artifact measures 18.6mm in length, 4.5mm in width, and 3.8mm in thickness. It was recovered from 30 to 40cm in depth in the South End of Overhang C.

Artifact #E344, from Cultural Level I within the Osmond Overhang, consists of a medial fragment of a split long bone of Sylvilagus (cottontail

Manos, Cedar Siding Shelter

The three most nearly complete specimens from Cedar Siding: a) E341 (bifacial), b) E399 (bifacial), c) E338 (bifacial).

PLATE 18

Digging Stick, Cedar Siding Shelter, Overhang C, South End, Feature 10.
Utilized ends are on left, broken ends on right.

PLATE 19

Worked Mammal Incisors, Cedar Siding Shelter

Left - E342, porcupine incisor, Overhang C, South End, Feature 10.
Right - E343, artiodactyl incisor, Overhang C, South End.

PLATE 20

rabbit). Both ends of the highly polished bone have been cut, beveled, and polished for an undetermined purpose. The bone measures 34.6mm long, 5.2mm wide, and 3.0mm thick.

An additional fragment of worked bone (#E345) was recovered in two pieces, one from 10cm depth in Grid Unit 3N17W and the other from 20-30cm depth in 10N17W. The bone is of an indeterminate mammal and has been flattened on 3 sides (the fourth side is broken) forming a sub-rectangular transverse cross-section. The worked faces all exhibit numerous parallel and perpendicular striations. This specimen, measuring 29.8mm long, 4.6mm wide, and 4.0mm thick, appears to be a fragment of a tool such as an awl or weaving tool.

One small (2.3cm in diameter), apparently unmodified basalt stone ball (#E306) was recovered from 60cm below ground surface in Overhang B. Similar balls, commonly associated with Fremont sites, have been referred to in the literature as "gaming pieces", "ceremonial objects", or "enigmatic objects" (Madsen and Lindsay 1977:66). At Backhoe Village, however, they were located in direct association with manos and are thought to have been used for food preparation (ibid:66). The Cedar Siding Specimen, although unshaped, did not appear to be in natural context in the fill and consequently is considered, at minimum, a "portafact".

Historic Artifacts

Fifteen historic artifacts were located at Cedar Siding Shelter. Copper buttons were the most numerous of these, there being 6 complete or fragmentary specimens. Three are whole buttons (with the lettered front and fitted backing), and 1 consists of the lettered front without the backing. Three button fronts (#E312, #E315, and #E317) exhibit the lettering "FINCK DETROIT" and measure 0.67" in diameter. The fourth exhibits the lettering "FINCK DETROIT SPECIAL" (#E322) and is a larger specimen, measuring 0.79" in diameter. Two button backings (#E319 and #E310), measuring 0.58" and 0.39" in diameter, were also located. The buttons were found from the surface to a depth of 15cm in Overhang C, South End.

Two .22 shells (#E330 and #E332) and a fragment of bullet lead (#E331) were located at depths from 0-20cm. Two small fragments of newsprint, (#E333 and #E326) and a wooden match (#E329) were collected from 1-40cm. A small iron spring of unknown use (#E324) was found from 0-20cm in the South End.

A glass bead fragment (#E309) of turquoise color was located in the disturbed fill of the vandal pit in Overhang C, South End. Broken roughly in half, it measures 0.08" (2mm) in diameter and 0.03" (0.8mm) in thickness.

Total depth range of historic artifacts was from 0-40cm, indicating a mixture of fill in some proveniences (primarily Overhang C).

CULTURAL BACKGROUND

Although it has been sparse and primarily in the form of surface finds, enough evidence has been found to indicate that eastern Utah was occupied at least occasionally by Paleo-Indians, the earliest inhabitants of Western America (Nickens 1982:5).

The Paleo-Indian stage comprises three cultural complexes: the Llano, the Folsom, and the Plano. The oldest of these peoples, the Llano, hunted the now-extinct mammoth using long lanceolate, fluted points known as Clovis points. Estimated dates for the Llano complex are 12000-11000 B.P. The Folsom complex, dating roughly from 11000-9000 B.P., is identified by the Folsom point--also lanceolate but smaller, thinner, and characterized by flutes extending the entire length of the point. Folsom peoples are presumed to have hunted the now-extinct Bison antiquus. The Plano complex, dating roughly from 9000-7000 B.P., is the last (youngest) division of the Paleo-Indian stage. The points of this complex are varied, many appearing to be more crudely manufactured and larger in size than their Folsom predecessors. Animal remains associated with Plano points in eastern Utah are typically those of antelope and modern bison, although it is also suggested that the Plano people were partially responsible for the extinction of the Pleistocene bison.

There is little information available concerning the nature of the transition between the Paleo-Indian and subsequent stages, but it is probable that the cultures existed contemporaneously during late Paleo times (ibid:10). The Archaic Culture is thought to have evolved in response to the extinction of the large Pleistocene mammals. Having to rely on the hunting of smaller game such as deer, bighorn sheep, rabbits and rodents, the Archaic people found the exploitation of a greater number of floral species necessary as well.

Madsen (1979a:9) has proposed a general chronology for the Archaic peoples of the Great Salt Lake area based upon apparent variations in subsistence and settlement patterns: Early Archaic (ca. 8500-5500 B.P.), basically sedentary with subsistence based on marsh and lake-edge resources, population growth; Mid-Archaic (ca. 5500-3500 B.P.), migratory hunting and gathering, population reduction; Late Archaic (ca. 3500-2500 B.P.), increase in upland hunting and gathering on Plateau, population decline and regional abandonment in northeastern Great Basin.

Perhaps more germane to the Cedar Siding Shelter is an Archaic classification based on projectile point typologies proposed by Alan Schroedl which combines evidence from Cowboy Cave and Sudden Shelter and applies to sites of the northern Colorado Plateau (Jennings 1980:37, 148). The earliest phase, the Black Knoll, ranges from 8300 to 6200 B.P. Pinto points dominate; Northern Side-notched points occur toward the end of the phase. The Castle Valley Phase ranges from 6200 to 4500 B.P. and is characterized by three projectile points: Sudden Side-notched, Hawken Side-notched, and Rocker Base Side-notched. The third phase, the Green River, dates from 4500 to 3300 B.P. and is associated with the Gypsum point. The last phase dates from 3300 to 1500 B.P. and is known as the Dirty Devil Phase. The Gypsum point dominates the earlier half of this phase, but Rose Springs arrowpoints replace them toward the end of the phase.

Schroedl posits the Upper Grand Canyon in Arizona as the place of origin for certain Archaic traits. He believes that, beginning around 4000 B.P., these traits moved north along the Colorado River to the Northern Plateau where, as confirmed by radiocarbon dates and projectile point types, they appear from 2100-1500 B.P. (Nickens 1982:17). It would seem, however, that while providing a corridor for migration, the Colorado River could also have served as a physical (and hence cultural) barrier--Archaic (and later) sites south of the river generally exhibit a southwestern influence, while sites north and west of the river appear to be influenced more by Great Basin cultures.

Cynthia Irwin-Williams' regional Desert Archaic variant, the "Picosa", separates the Southwest from the Great Basin Archaic groups and has been identified as a progenitor for most of the Formative Stage cultures in the Southwest. Three geographic divisions compose the Picosa; one of these, the Northern Sector, includes most of the Colorado Plateau (ibid:12). Although evidence is currently far from conclusive, the Picosa has been tentatively divided into two major developmental periods, the earlier dating from ca. 5000 to 3000 B.P. (originating from the early Archaic) and the latter extending from ca. 3000 to 1950 B.P. Variance in artifact typologies appears to separate the Picosa from other Archaic groups, but the most important difference is their early practice of horticulture (ca. 4000 B.P.).

At Clyde's Cavern, in the vicinity of the San Rafael Swell, and Cowboy Cave, in southeast Utah, both corn cultivation and the gathering of wild plants were practiced during the Late Archaic period (Winter and Wylie 1974:314). It appears, however, that the corn was fairly unproductive and was not heavily relied upon as a food source. Its presence in Archaic sites, however, does suggest a more sedentary lifeway, at least on a seasonal basis (ibid:314).

This trend toward a more sedentary lifeway in the Archaic is substantiated by the discovery of a pithouse floor (5GF126) at Battlement Mesa Community in west central Colorado (Conner and Langdon, in progress). The floor was a roughly circular, basin-shaped depression showing evidence of a superstructure in the form of eight possible postholes within and around the perimeter of the pithouse and a single, larger one near the center of the floor. A radiocarbon date taken from the hearth in the pithouse floor produced a Late Archaic date of 2770 ± 60 years before present (approximately 800 B.C.), contemporaneous with Schroedl's Dirty Devil Phase. The presence of a small corner-notched point which appears to be a forerunner of the Rose Springs Corner-notched arrow point style suggests the bow and arrow appeared in the region earlier than previously believed.

With the appearance of such items as the bow and arrow and ceramics around the 4th and 5th centuries A.D., the Archaic lifestyle was gradually replaced (in most areas) by the Formative Stage, or Fremont culture. Some see the Archaic-Fremont transition in the Great Salt Lake area as a result of an improvement in grassland conditions, increased bison hunting, and the practice of corn horticulture nearby (Winter and Wylie 1974:314). Generally speaking, by the Formative stage, corn grown by the northernmost horticulturalists, i.e., the Fremont, was dented, this trait dispersing south to the Anasazi prior to A.D. 700 (Winter 1977:105). Apparently, eight-row corn (Maiz de Ocho) is most

commonly an Anasazi trait, its presence declining further to the north. (In northern Utah, the average frequency of Maiz de Ocho in collections of more than 20 cobs is 8%). This type appears in Fremont contexts around A.D. 1000. Judging from corn samples procured from three San Rafael Fremont sites, ten and twelve-row corn is the most prevalent (Winter 1977:109).

The most distinctive trait of the Fremont people is their unique and magnificent rock art--large-headed trapezoidal anthropomorphic figures often wearing elaborate necklaces, body decoration, and head gear; shield figures, concentric circles, and spirals; and small, less well-executed zoomorphic figures (Schaafsma 1971:b). Other characteristics include the manufacture of distinct pottery and basketry types, the use of deerhide moccasins instead of yucca-fiber sandals, shaped stone balls, and circular stone structures located on ridgetops or prominences. Pithouses were commonly used for housing. Large extended families probably occupied small pithouse villages, while isolated farmsteads served smaller family groups. Much of the population probably traveled to hunt large mammals and to exploit wild floral resources whose time of harvest did not conflict with the planting and harvesting of domesticates.

Theories concerning the origins of the Fremont are varied. The three major areas of origin include the Great Plains, the Southwest, and in situ development. It seems most probable that peoples were influenced by cultures of closest proximity--the northern peoples by some of the Plains cultures, the western peoples by the Great Basin, and southern groups acquiring more Anasazi Basketmaker traits.

Some authorities see the Fremont as one culture with regional subdivisions between the Basin and Plateau groups, their differences simply demonstrating their highly adaptive nature (Marwitt 1979:733). Others consider the Wasatch Plateau as being the dividing line between the "Sevier", those whose lifeway centered around lake and marsh ecosystems, and the Plateau "Fremont", whose economic strategies reflected a more arid, upland environment (Madsen 1979b: 711).

The San Rafael Fremont, a variant of the Colorado Plateau Fremont defined on the basis of architectural, lithic, and ceramic evidence, occupied most of eastern Utah with the exception of the area south of the Colorado River and roughly north of Nine Mile Canyon (Marwitt 1970). Dates obtained from Bull Creek for this variant range from A.D. 785 to 1240 (Jennings and Sammons-Lohse 1981:138). A characteristic feature of the San Rafael Fremont is the clay-rimmed, flagstone firepit found in pithouses (usually situated on knolls and ridges in small clusters of three or less, close to dependable water sources) (ibid:5).

Theories concerning the fate of the Fremont are as varied as those concerning their origin. Excavations of Fremont sites indicate abandonment of the northern Colorado Plateau in the 12th and early 13th centuries, slightly earlier than the exodus of their Anasazi neighbors to the south. Changes in rainfall patterns, drought, and pressure from raiding newcomers may have contributed to the demise of the Fremont culture.

The next group to occupy the northern Colorado Plateau were the Shoshoni (including the Ute and Paiute), speakers of a Numic variation of the Uto-Aztecan language family. Little archaeological evidence exists to indicate when the Numic-speaking groups entered the Colorado Plateau (from a homeland near Death Valley in southern California); however, comparison of dialects suggests entrance into the Great Basin around A.D. 1200 and the Colorado Plateau region a century later (Nickens 1982:36). Pursuing an Archaic lifestyle, the Utes and Paiutes wandered throughout the Colorado Plateau in small groups searching for food, using temporary structures of pinyon and juniper, known as wickiups, and rockshelters and overhangs for shelter. Compared with their predecessors, the horticulturist Fremont, the Utes and Paiutes followed a rather simplistic lifestyle.

Acquisition of Spanish horses in the mid-1600s radically changed the existence of the Utes. (The Paiutes seldom used horses for transportation purposes, and continued a simple hunting/gathering subsistence). Small family groups of Utes banded together to form large raiding or hunting parties, many riding east over the Rocky Mountains to hunt bison whose numbers were limited west of the mountain range (Smith 1974:20). Horses, and the occasional use of the travois, enabled the Utes to transport heavy bison-hide tipis, replacing the small brush wickiups. Contact with the Plains tribes facilitated the acquisition of some of their arts, particularly that of beadwork.

White encroachment on the West during the 19th century gradually forced North America's native inhabitants from their lands. By 1900, after numerous conflicts and broken treaties, the Utes and Paiutes were confined to reservations and their former territories were opened to settlement.

The first Europeans in the area were Spaniards who came north to trade with the Utes. The "Old Spanish Trail", originating in Santa Fe, headed north through Colorado to the Gunnison River, then followed the Colorado River into Utah until the river veered southwest. Continuing westward, the trail crossed the Green River at the site of the present town of that name. One branch then trended northwest, following the Price River (to a point approximately six miles south of the study area), then the Spanish Forks River to Utah Lake.

Government exploration of the area began in 1853, when John W. Gunnison, in search of a railroad route from St. Louis, Missouri, led a survey party along much of the Old Spanish Trail. The same year, John C. Fremont traced Gunnison's route, working on another railroad survey. After crossing the Green River, his party was fed by a group of Indians who were living on "...nothing else but grass seed, which they collected in the fall. Their women parch it, and grind it between stones. In this manner it is very palatable, and tastes very much like roasted peanuts. This, their only article of food, was very scarce, and we could produce only a small supply." (Mauerman, in Rauch 1981:42).

Settlement of Castle Valley began in the late 1870s. Farming and coal mining were pursued, the latter becoming quite lucrative in 1883 when the Denver and Rio Grande Western narrow gauge was completed from Salt Lake City to Green River (connecting with the line from Denver). A standard gauge replaced the narrow gauge tracks in 1890 and, spurred by the railroad, Emery

and Carbon Counties became the leading coal producers of the West (Poll in Rauch 1981:43). Today, mining and agriculture still form the economic base of the area.

CONCLUSIONS AND ARCHAEOLOGICAL INTERPRETATION

Chronology and Cultural Affiliations

Of the cultural stages dealt with in the preceding section of this report, several are represented in the material remains at Cedar Siding Shelter. The radiocarbon dates and projectile points recovered indicate a series of occupations ranging from the Middle Archaic (Green River Phase) through the Fremont (Formative Stage). Because of the geographical location of Cedar Siding, the Fremont-associated materials are assumed to be affiliated with the San Rafael Variant (see "Cultural Background"). In addition, the glass trade bead fragment and variety of historic artifacts demonstrate that later peoples also occupied or visited the site and that an indeterminable amount of the non-diagnostic specimens at the site are possibly associated with post-Fremont components.

If the 17 radiocarbon dates obtained from the Cedar Siding Shelter can be considered a representative sample--admittedly a tenuous presumption--then four general clusters of dates can be discussed (see Table 1 and Figure 31). The earliest cluster of five dates ranges from 4100 to 3630 years B.P.--well within the established limits of the Middle Archaic or Green River Phase. Apparently, the Sudden Side-notched point (E281), and possibly the Gypsum Point (E282) as well, are associated with this early range of occupation.

Following this cluster of dates is the longest hiatus represented in the analyzed charcoal samples from Cedar Siding--spanning 750 years. The next five dates cluster quite tightly between 2880 and 2600 B.P.--the Late Archaic or Dirty Devil Phase. The aforementioned Gypsum Point (E282) is also possibly affiliated with these dates. (The contact zone between Levels H-III and H-IV where it was found produced hearths dating from both the Middle and Late Archaic.)

Following a second hiatus of over 400 years, the third group of radiocarbon dates falls in the range of from 2190 to 1980 years B.P. This cluster of three dates, and an isolated date of 1570 ± 60 B.P., are of particular interest in that they indicate a continuity of occupation in the area between Late Archaic and Fremont times. Madsen and Berry (1975) have summarized archaeological data from the northeastern Great Basin which appears to suggest that the area suffered a drought and was abandoned by the Archaic hunters and gatherers by around 2500 B.P. and remained generally unoccupied until the influx of the Fremont peoples at ca. 1500 B.P. A similar occupational hiatus on the northwestern Colorado Plateau for the period from ca. 3400 to 1800 B.P. has been suggested by the lack of radiocarbon dates during this time span at Pint-Size and Sudden Shelters (Lindsay and Lund 1976:56-57). The Cedar Siding Shelter, however, demonstrates the lack of any such abandonment on this, the eastern periphery of the Great Basin.

Gordon et al. (1981:189) report an apparent influx of Great Basin cultural attributes into northwestern Colorado during the Middle and Late Archaic,

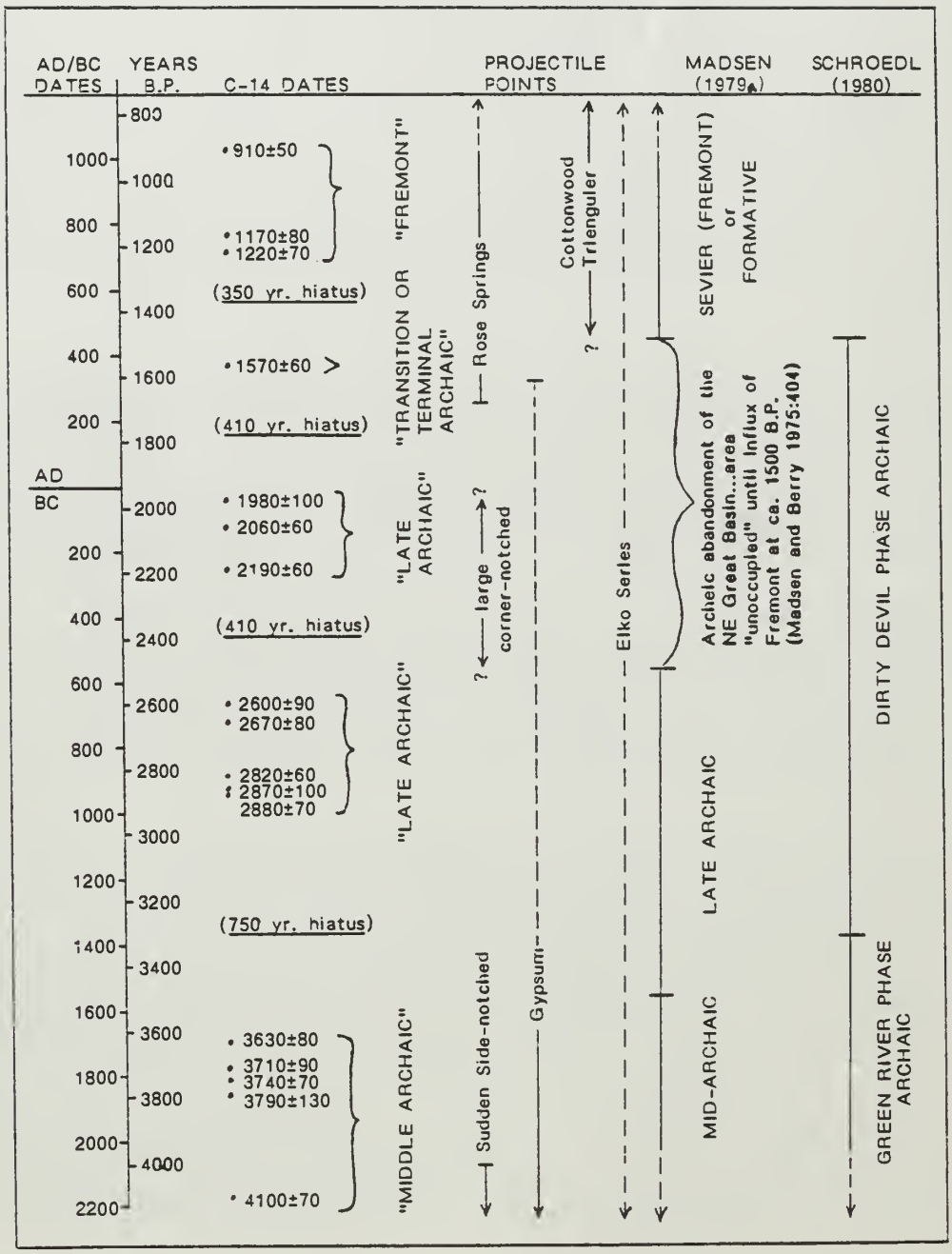


Figure 31. Chronology at Cedar Siding Shelter (42EM1533).

possibly reflecting an eastward population movement during the drought. The latest of the four dates that fall within the range of Madsen and Berry's "abandonment" period is chronologically isolated from the rest of the analyzed samples. A date of 1570 ± 60 B.P. was secured from Feature 20, a period which can be considered "terminal Archaic" or "transitional" to the Fremont when viewing the Great Basin and Colorado Plateau as a whole.

While all of the projectile point types represented at Cedar Siding (other than Sudden Side-notched) have been found in archaeological contexts elsewhere dating within the range being considered here (2190 to 1570 B.P.), the Rose Springs and small Cottonwood Triangular points (E285, E286, E195) are generally considered to be of post-Archaic manufacture.

The final cluster of dates from Cedar Siding has been attributed to a Fremont occupation. These three dates span a period from 1220 to 910 years B.P. The aforementioned late projectile points, the stone ball, and the ceramic sherds from Locus II are most likely associated with these dates.

Spatial Analysis and Activity Areas

A spatial analysis of the cultural materials from the site revealed a number of examples of non-random distribution among various classes of tools and debitage. This analysis relied most heavily on data from the primary excavation proveniences of Overhangs B and C, as the recovery of artifacts from other locations at the site was often too limited to allow statistically significant comparisons to be made, or the materials were compressed vertically so as not to allow for temporal considerations (as in the case of the general surface collections and in Overhang E).

After the tools and debitage had been tabulated and precentages computed, a list of all the inconsistencies was constructed (for example, although only 0.6% of the flakes from the site exhibited wear from utilization, 30% of the flakes from Locus II, Surface were utilized). Statistical tests were then conducted on each of these apparent inconsistencies in order to test the null hypothesis of random distribution for the various tool types, classes of flakes, attributes, and so forth, involved. Only those tests which indicate non-random distribution (at the 0.05 level of significance) are described herein. In order to compare artifact-type frequencies through time, arbitrary levels of 0 to 40cm, 40 to 60cm, and 60cm and below were chosen. It is at the 40 and 60cm levels that apparent changes in the density of the debitage were noted during excavation.

Using the chi-square one-sample test, observed frequencies, or artifact-type counts, have been compared to the expected frequencies of the artifact types. The expected frequencies are based on percentage of an artifact type in a particular provenience compared to the percentage of debitage in that same provenience (see Table 3). In this way, the expected frequencies for each cell of the one-sample chi-square have been generated, assuming even (random) distribution of the artifact type within the total debitage population for the proveniences sampled (the null hypothesis). In other words, debitage

Table 3
Debitage Tabulations by Major Provenience, All Depths Considered
Cedar Siding Shelter (42EM1533)

		MATERIAL				CORTEX			OTHER		
PROVENIENCE	Total	Chert	Quartzite	Chalcedony	Other	Primary	Secondary	Interior	Utilized	Biface Thinning	Parallel Dorsal Scars
Locus I-Surface	458	172	213	6	67	32	40	386	16	5	2
	3.0%	37.6 / 2.6 %	46.5 / 3.3 %	1.3 / 0.5 %	14.8 / 8.3 %	7 / 7.9 %	8.7 / 11.0 %	84.3 / 2.7 %	3.5 / 17.3 %	1.1 / 6.2 %	0.4 / 3.4 %
Locus II-Surface	90	52	26	1	11	18	19	53	27	0	0
	0.6%	57.8 / 0.8 %	29 / 0.40 %	1.1 / .07 %	12.2 / 1.4 %	20 / 4.4 %	21.1 / 5.2 %	58.9 / 0.4 %	30.0 / 29.3 %	0 / 0 %	0 / 0 %
Overhang A	7	7	0	0	0	1	1	5	0	0	0
	.04%	100 / 0.1 %	0 / 0 %	0 / 0 %	0 / 0 %	14.3 / 0.2 %	14.3 / 0.3 %	71.4 / 0.1 %	0 / 0 %	0 / 0 %	0 / 0 %
Overhang B	6984	3055	2726	801	402	145	105	6734	19	38	23
	46.7%	43.7 / 47.2 %	39.0 / 42.4 %	11.4 / 63.8 %	5.7 / 49.9 %	2.07 / 36.1 %	1.5 / 28.9 %	96.4 / 47.4 %	0.27 / 20.6 %	0.5 / 46.9 %	0.32 / 39.6 %
Overhang C, Hallway	4429	1785	2107	309	228	118	114	4197	22	21	15
	29.8%	40.3 / 27.6 %	47.5 / 32.8 %	6.9 / 24.6 %	5.14 / 28.3 %	2.66 / 29.4 %	2.5 / 31.4 %	94.7 / 29.5 %	0.49 / 23.9 %	0.47 / 25.9 %	0.33 / 25.8 %
Overhang C, South End	2242	1118	922	109	93	74	77	2091	6	17	13
	14.9%	49.8 / 17.2 %	41.1 / 14.3 %	4.9 / 8.6 %	4.1 / 11.5 %	3.3 / 18.4 %	3.4 / 21.2 %	93.3 / 14.7 %	0.26 / 6.5 %	0.75 / 20.9 %	0.57 / 22.4 %
Overhang E	713	262	422	25	4	11	6	696	1	0	5
	4.7%	36.7 / 4.1 %	59.1 / 6.5 %	3.5 / 1.9 %	0.6 / 0.5 %	1.5 / 2.7 %	0.8 / 1.7 %	97.6 / 4.9 %	0.14 / 1.0 %	0 / 0 %	0.70 / 8.6 %
Osmond Overhang	24	14	6	4	0	2	1	21	1	0	0
	0.2 %	58.3 / 0.2 %	25.0 / 0.1 %	18.6 / 0.3 %	0 / 0 %	8.3 / 0.5 %	4.2 / 0.3 %	87.5 / 0.1 %	4.16 / 1.1 %	0 / 0 %	0 / 0 %
TOTALS	14,947	6465	6422	1255	805	401	363	14,183	92	81	58
	100 %	43.2 %	42.9 %	8.3 %	5.3 %	2.6 %	2.4 %	94.8%	0.6 %	0.5%	0.3 %

%: $\frac{x}{y}$ % where x = percent of total flakes in provenience and,
y = percent of total flakes with that attribute.

density was used as an index for overall density of cultural debris in a particular area and, in turn, randomly distributed artifact types were "expected" to be distributed in a like manner. Unless otherwise noted, the following tests are based on comparisons of only those artifacts collected from Overhangs B and C.

Test 1

Frequencies of biface tip fragments to the north and south of the 12N line were compared (see Figure 32). Twenty-four tips (89%) occurred to the north of the 12N line, while only 4 tips (11%) were located south of the 12N line. Unfortunately, the chi-square test could not confidently be applied since the minimum sample size required in each cell is five; nonetheless, if used, the chi-square test does indicate a significant non-random distribution of the biface tips. It is evident that a significantly greater than expected number of tips occurred north of the 12N line in relation to the amount of debitage (69%) in that area.

Hypothesis: That bifaces were being used more in the area north of the 12N line (Overhang B), and the tips were breaking off more frequently in this area (cutting activities such as butchering or wood-working are suggested). The high number of medial and basal transverse snap fractures possibly indicates that many of these tools were hafted. If so, then a possible explanation for the fact that a majority of the biface bases were found elsewhere (see Test 2) is that the handles, with the broken bases still attached, were taken elsewhere (The Hallway) to be re-fit with another biface.

Test 2

The frequencies of biface basal fragments to the north and south of the 13N line were compared (see Figure 33). Ten bases (40%) were located to the north of this line, 15 bases (60%) to the south. The chi-square test indicated that a significantly higher number of bases occurs to the south of the 13N line when compared to the number of flakes (40%) present.

Hypothesis: That the basal fragments of bifaces whose tips had been broken off elsewhere during use were being carried here (primarily The Hallway) and then discarded (see Test 1).

Test 3

Frequencies of biface thinning flakes (herein defined as biface resharpening flakes) from Overhang B from the three arbitrary levels of 0-40cm, 40-60cm, and 60cm and below were compared (see Table 4 and Figures 34, 35, and 36). The 0-40 level yielded 24 thinning flakes (52%), the 40-60 level had 8 (17%), and below 60cm were 14 (30%). Compared to the total amounts of

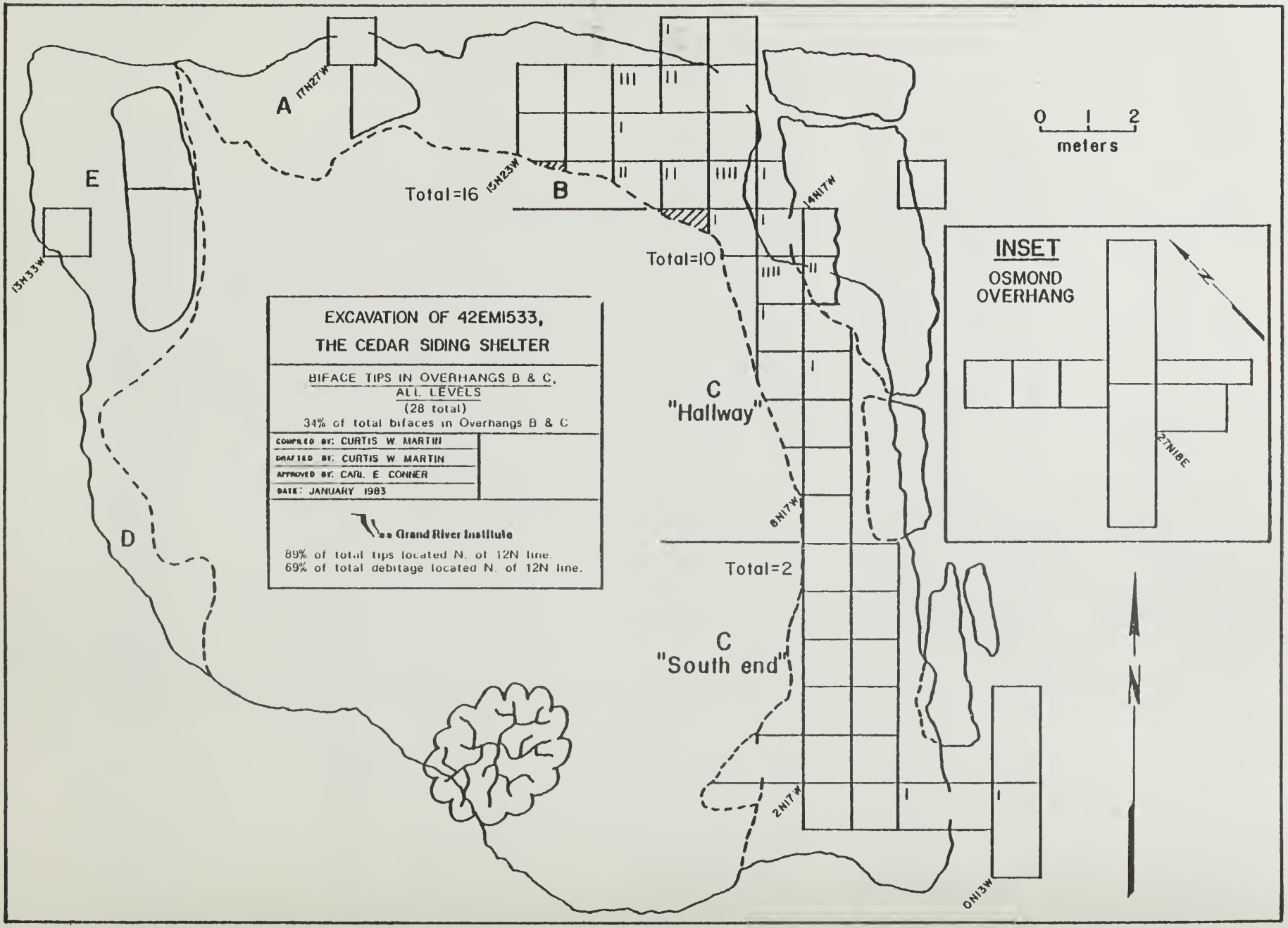


Figure 32. Plan view showing biface tips in Overhangs B & C, all levels.

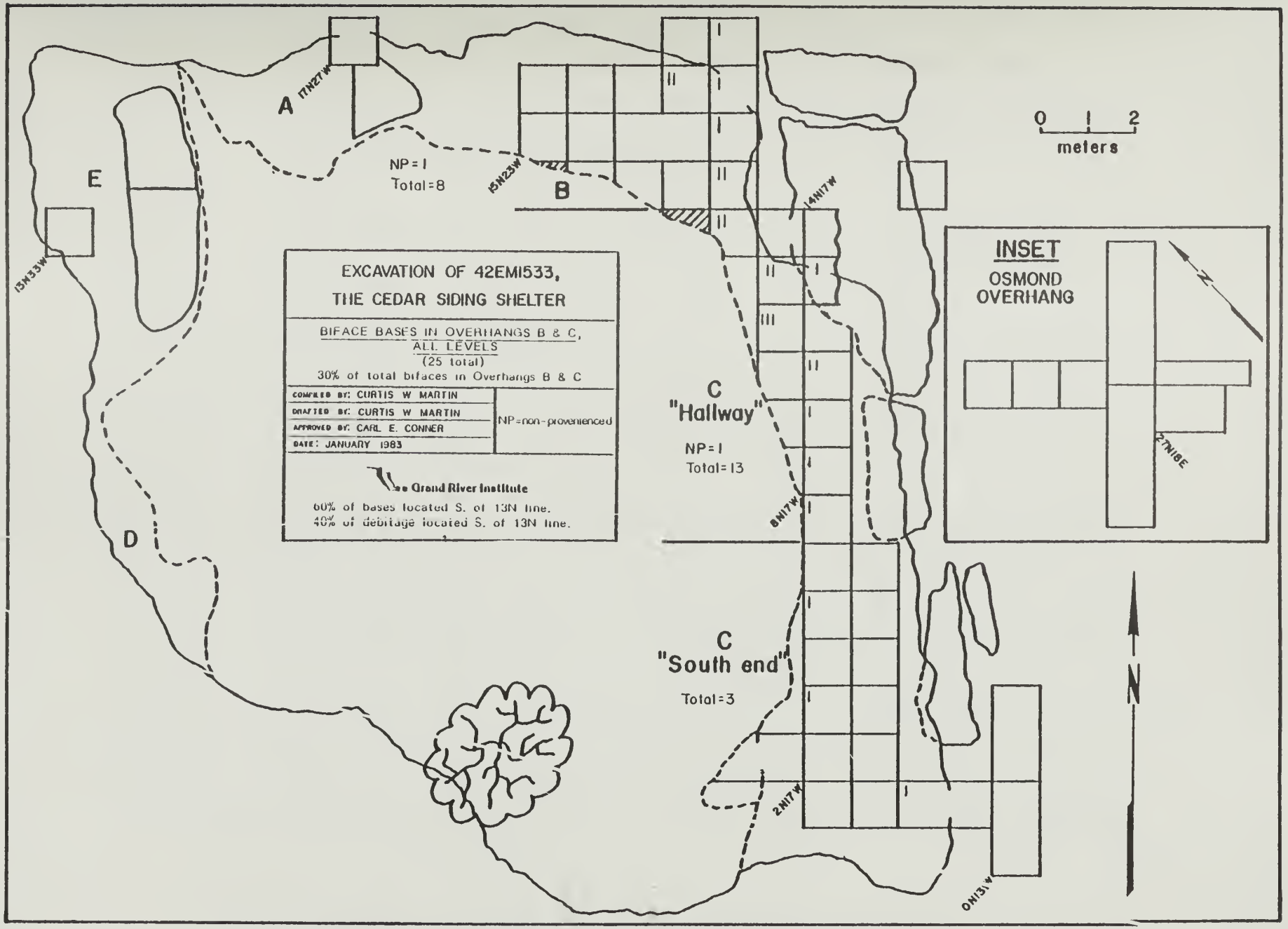


Figure 33. Plan view showing biface bases in Overhangs B & C, all levels.

Table 4
Debitage Tabulations for Primary Excavation Areas by Depth
Cedar Siding Shelter (42EM1533)

PROVENIENCE	Total	MATERIAL: Chart	Quartzite	Chalcedony	Other	CORTEX: Primary	Secondary	Interior	OTHER: Biface Thinning	Parallel Dorsal Scars	DEPTH
Overhang B	4689	2106	1800	534	249	105	76	4508	24	16	
	50.4%	44.9 / 51.9 %	38.3 / 45.6 %	11.3 / 64.7 %	5.3 / 52.4 %	2.2 / 51.4 %	1.6 / 43.1 %	96.1 / 50.6 %	0.5 / 44.4 %	0.3 / 41.0 %	
Overhang C, Hallway	2958	1108	1478	223	154	51	47	2860	16	12	
	31.9%	37.4 / 27.3 %	49.9 / 37.4 %	7.5 / 27.0 %	5.2 / 32.4 %	1.7 / 25.0 %	1.6 / 26.7 %	96.6 / 32.0 %	0.54 / 29.6 %	0.4 / 30.8 %	0-40cm.
Overhang C, South End	1648	840	668	68	72	48	53	1547	14	11	
	17.7%	51.0 / 20.7 %	40.5 / 16.9 %	4.1 / 8.2 %	4.3 / 15.1 %	2.9 / 23.5 %	3.2 / 30.1 %	93.8 / 17.3 %	0.84 / 25.9 %	0.7 / 28.2 %	
TOTAL	9295	4054	3946	825	475	204	176	8915	54	39	
	100 %	43.6 %	42.4 %	8.8 %	5.1 %	2.2 %	1.8 %	95.9 %	0.6 %	0.4 %	
Overhang B	1153	450	557	102	44	18	19	1116	8	7	
	44.2%	39.0 / 39.9 %	48.3 / 46.7 %	8.8 / 54.8 %	3.8 / 44.0 %	1.6 / 22.0 %	1.6 / 19.2 %	96.7 / 46.0 %	0.7 / 61.5 %	0.6 / 70.0 %	
Overhang C, Hallway	1186	550	522	69	45	49	68	1069	3	2	
	45.4 %	46.3 / 48.7 %	44.0 / 43.7 %	5.8 / 37.1 %	3.8 / 45.0 %	4.3 / 59.7 %	5.7 / 68.7 %	90.1 / 44.1 %	0.2 / 23.0 %	0.2 / 20.0 %	40-60cm.
Overhang C, South End	268	128	114	15	11	15	12	241	2	1	
	10.3 %	47.7 / 11.3 %	42.5 / 9.5 %	5.6 / 8.1 %	4.1 / 11.0 %	5.5 / 18.3 %	4.5 / 12.1 %	89.9 / 9.9 %	0.7 / 15.3 %	0.4 / 10.0 %	
TOTAL	2607	1128	1193	186	100	82	99	2426	13	10	
	100 %	43.3 %	45.8 %	7.1 %	3.8 %	3.2 %	3.8 %	93.0 %	0.5 %	0.4 %	
Overhang B	785	304	258	131	92	16	5	764	14	11	
	81.3 %	38.7 / 76.8 %	32.9 / 80.9 %	16.7 / 94.2 %	11.7 / 82.1 %	2.0 / 61.5 %	0.6 / 83.3 %	97.3 / 81.8 %	1.8 / 73.7 %	1.4 / 91.7 %	
Overhang C, Hallway	150	71	56	4	19	7	1	142	4	1	
	15.5 %	47.3 / 17.9 %	37.3 / 17.5 %	2.7 / 2.9 %	12.7 / 17.0 %	4.7 / 26.9 %	0.7 / 16.6 %	94.6 / 15.2 %	2.66 / 21.0 %	0.7 / 8.3 %	60cm.
Overhang C, South End	31	21	5	4	1	3	0	28	1	0	
	3.2 %	67.7 / 5.3 %	16.1 / 1.6 %	13.0 / 2.9 %	3.2 / 0.9 %	9.7 / 11.5 %	0 / 0 %	90.3 / 3.0 %	3.2 / 5.2 %	0 / 0 %	
TOTAL	966	396	319	139	112	26	6	934	19	12	
	100%	41.0 %	33.0 %	14.4 %	11.6%	2.7%	0.6 %	96.7%	1.9 %	1.2%	

% $\frac{x}{y}$ where x = percent of total flakes in that level and provenience and,
y = percent of total flakes with that attribute in that level.

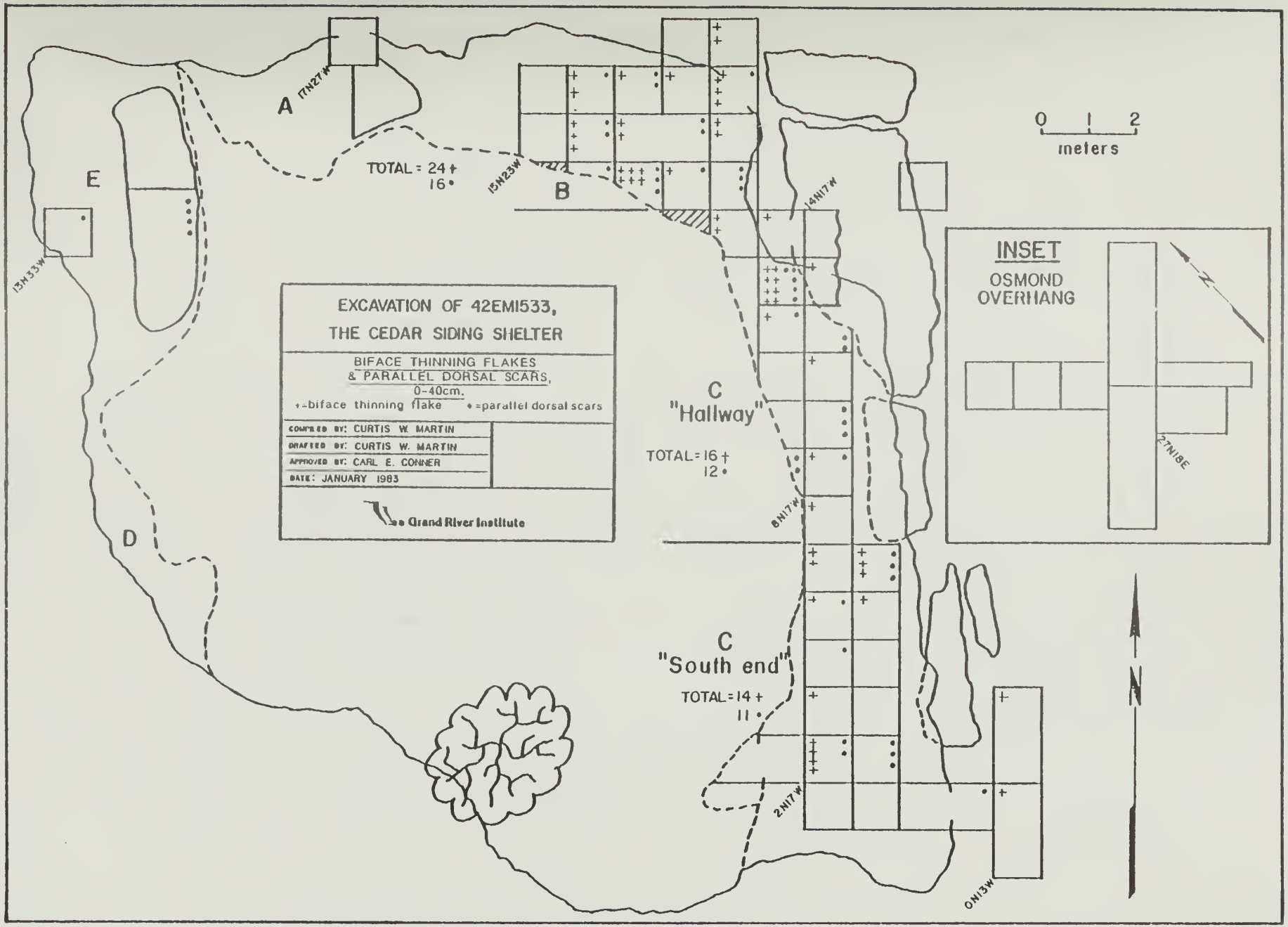


Figure 34. Plan view showing biface thinning flakes and parallel dorsal scars, 0-40cm.

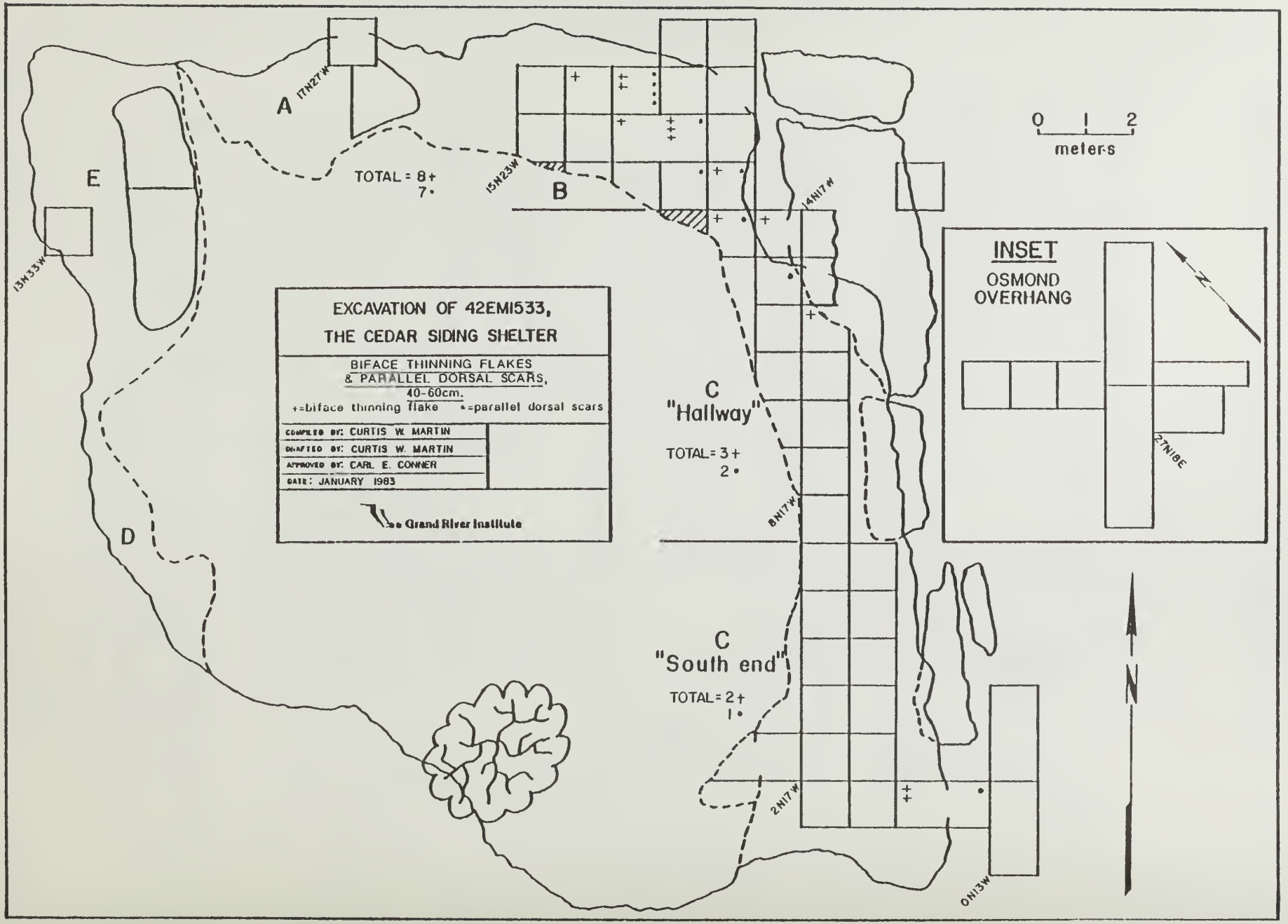


Figure 35. Plan view showing biface thinning flakes and parallel dorsal scars, 40-60cm.

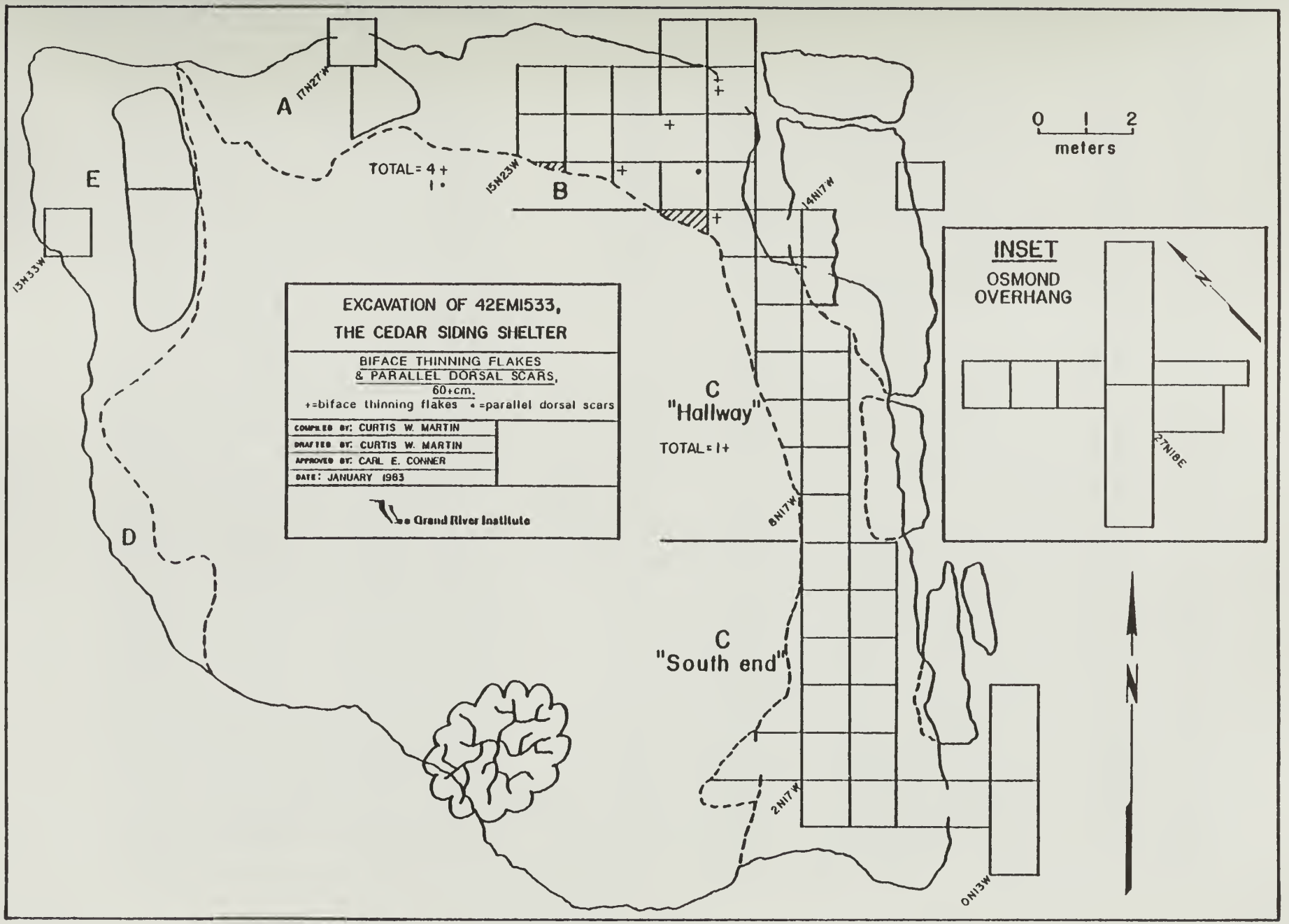


Figure 36. Plan view showing biface thinning flakes and parallel dorsal scars, 60+cm.

debitage in these levels there were significantly more thinning flakes found in the 60+cm level than expected, and noticeably less than expected in the 0-40cm level.

Hypothesis: That more biface resharpening (and therefore use?) was occurring during the earlier occupations of Overhang B.

Test 4

The distribution of flakes with parallel dorsal flake scars (also often an indication of biface shaping and/or resharpening) was investigated in Overhang B and it was found that they were distributed non-randomly in very much the same manner as the biface thinning flakes. Significantly more occurred in the 60+cm level of Overhang B, significantly fewer in the 0-40cm level (see Table 4 and Figures 34, 35, and 36). Sixteen such specimens were found in the 0-40cm level (47%), 7 in the 40-60 level (21%), and 11 below 60cm (32%).

It should be noted that there is also an apparent high percentage of parallel dorsal scars in the 40-60 level of Overhang B, and an apparent low percentage of these and biface thinning flakes in the 40-60 level of The Hallway (see Table 4). Unfortunately, the small sample size involved makes statistical verification difficult.

Hypothesis: That more uniform core reduction and/or biface thinning and resharpening (and therefore use ?) was occurring in Overhang B (supported by Test 1), especially during the earlier occupations of this overhang.

Test 5

A chi-square was run to test the obvious discrepancy between the percentage of surface-collected flakes which exhibited wear (utilization) versus those which had been excavated from sub-surface contexts (see Table 3). The discrepancy proved statistically significant. Of the 92 utilized flakes collected, 47% (43 flakes) came from the surface collections, although only a mere 3.6% of the debitage was from the surface.

Hypothesis: As no cultural reason could be found to explain this large discrepancy, the only logical conclusion that could be reached is that a high amount of the attrition and other wear noted on the lithics is due to post-depositional factors which affect surface artifacts more than those buried in the rockshelters. The obvious factors which come to mind are sheet-washing and the probable disturbance by hooved animals moving across the site. Both cattle and sheep grazing are known to have taken place in the site area in the past. The stone cairns and brush walls within the site boundaries, as well as the remains of a corrugated metal windbreak or animal pen directly south of Cedar Rock, attest to these activities (see Test 6).

Test 6

It was also statistically demonstrated that a higher than expected frequency of utilized flakes, per unit of debitage, was found on the surface of Locus II than on the surface of Locus I. Locus II, with only 16% of the surface debitage, produced 63% of the utilized surface flakes (see Table 3).

Hypothesis: a) Assuming that our hypothesis is true for most of the wear on surface artifacts being the result of post-depositional factors as opposed to aboriginal utilization (see Test 5), then it must follow that more of these external factors are operating on Locus II than on Locus I. If sheet-washing were the cause of the observed "utilization", then one would expect a higher percentage of wear on the Locus I specimens due to a generally steeper slope, a rockier surface, and the fact that there is more direct evidence of washing and erosion. If, however, impact from hooved animals is the cause of the wear, as suspected, then it is likely that Locus II flakes would sustain greater attrition, as Locus II is more open and level, more heavily vegetated, and would generally serve better as a grazing locality.

b) The only other explanation, of course, would be that the occupants of Locus II were using waste flakes more frequently as tools--an entirely plausible hypothesis, but one for which there is no other supportive evidence.

If, indeed, the hypotheses put forth in Tests 5 and 6 are true, then this casts serious doubts on the validity of wear-pattern analysis of the surface artifacts from this or any other lithic site.

Tests 7 through 12

These six chi-square tests dealt with various examples of the non-random distribution of cortical flakes in Overhangs B, C Hallway, and C South End. The results are summarized briefly below (see Tables 3 and 4 and Figures 37, 38, 39, and 40).

Test 7 compared the percentage of flakes which contained cortical surfaces (either primary or secondary in extent) among the 3 proveniences from all depths. Cortical flakes tended to cluster most in the South End and least in Overhang B.

Test 8 demonstrated that there was also an extremely high percentage of cortex found among the surface debitage when compared with that from excavated proveniences (possibly indicating a tendency to decortify cores before taking them into the shelters for finer work).

Test 9 indicated that a significantly higher percentage of cortical flakes occurred in the lower, 40-60cm level of Overhang C, South End than in the 0-40cm level (the 60+cm level was too limited to test statistically).

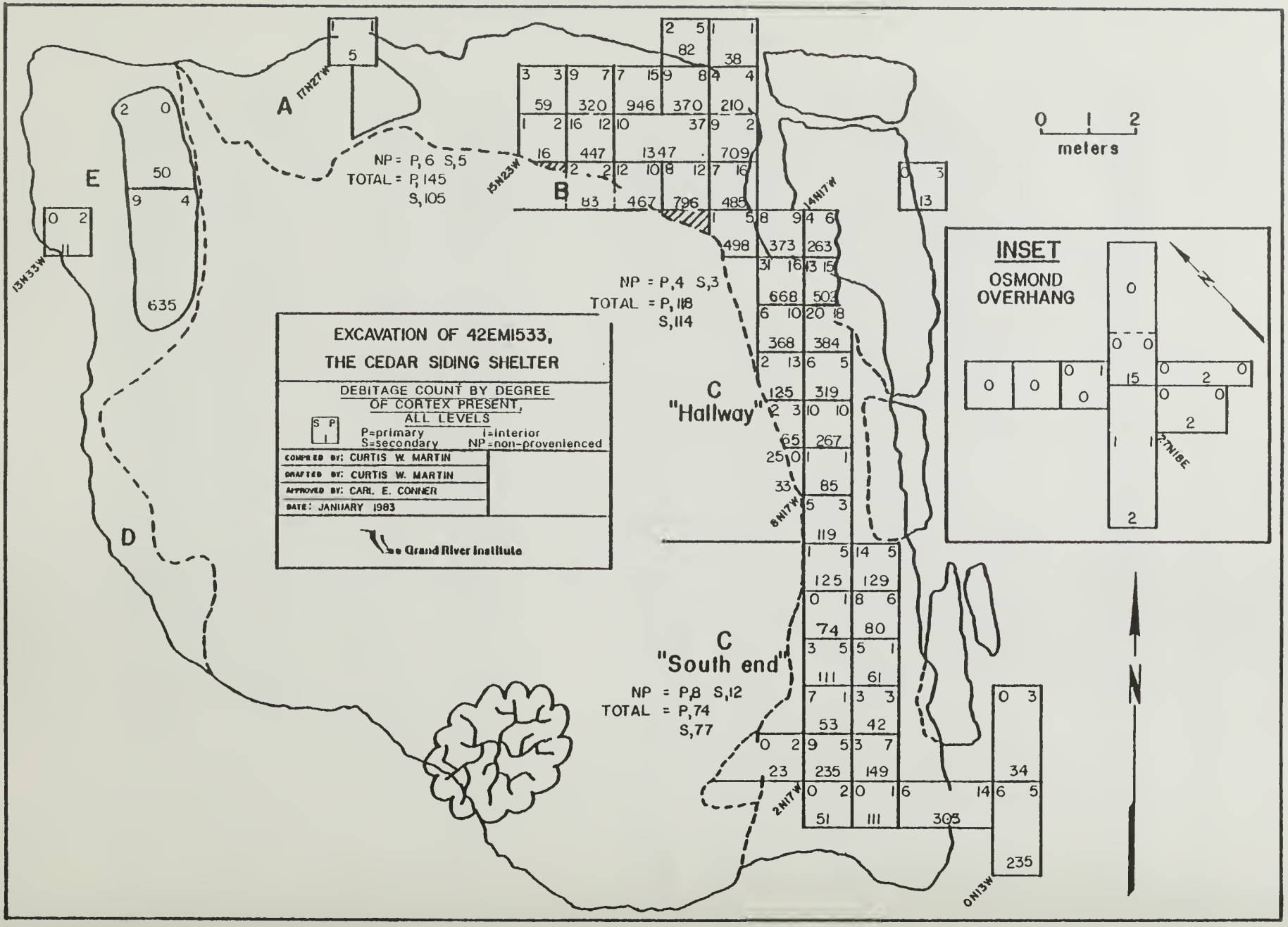


Figure 37. Plan view showing debitage count by degree of cortex present, all levels.

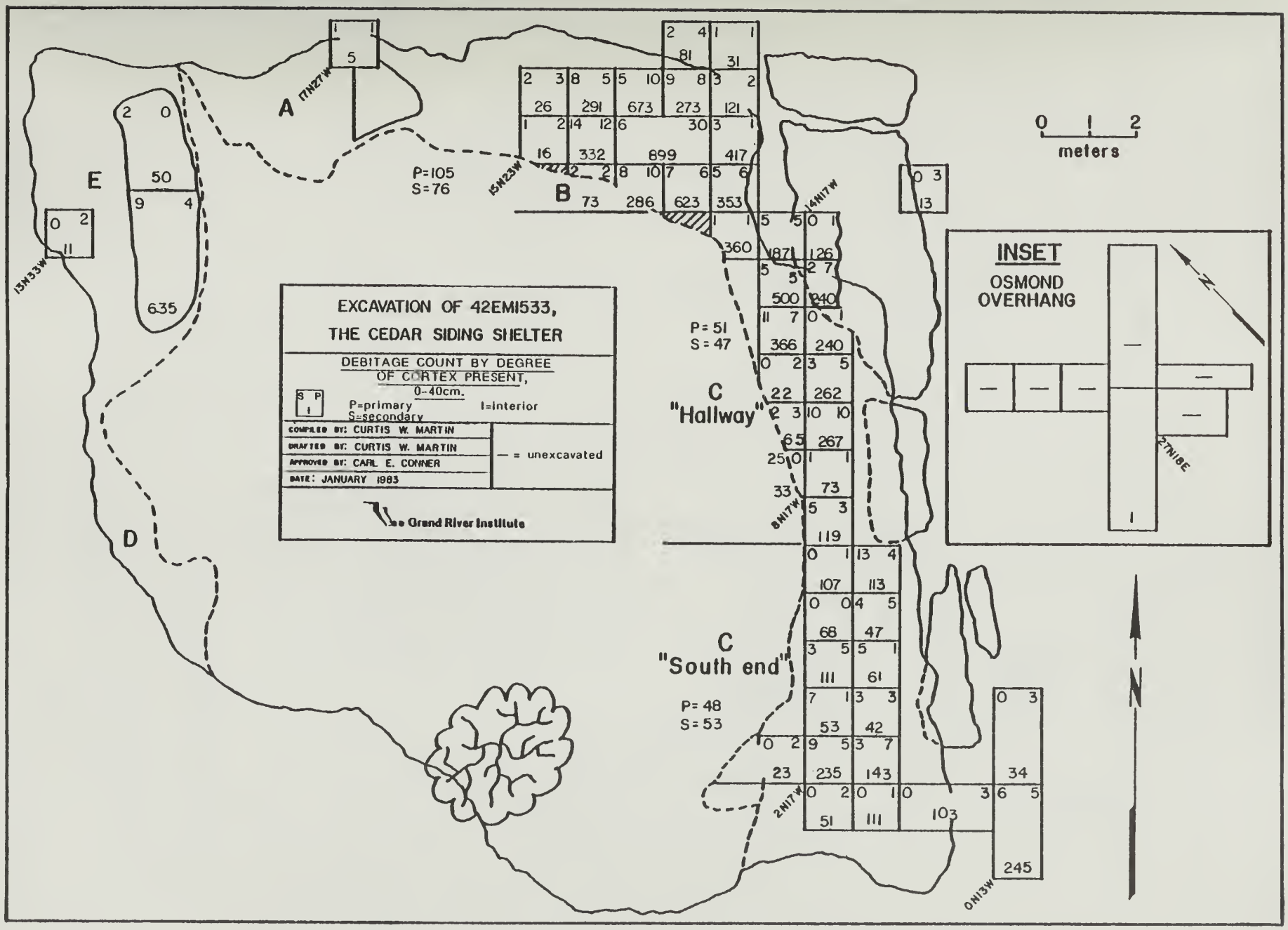


Figure 38. Plan view showing debitage count by degree of cortex present, 0-40cm.

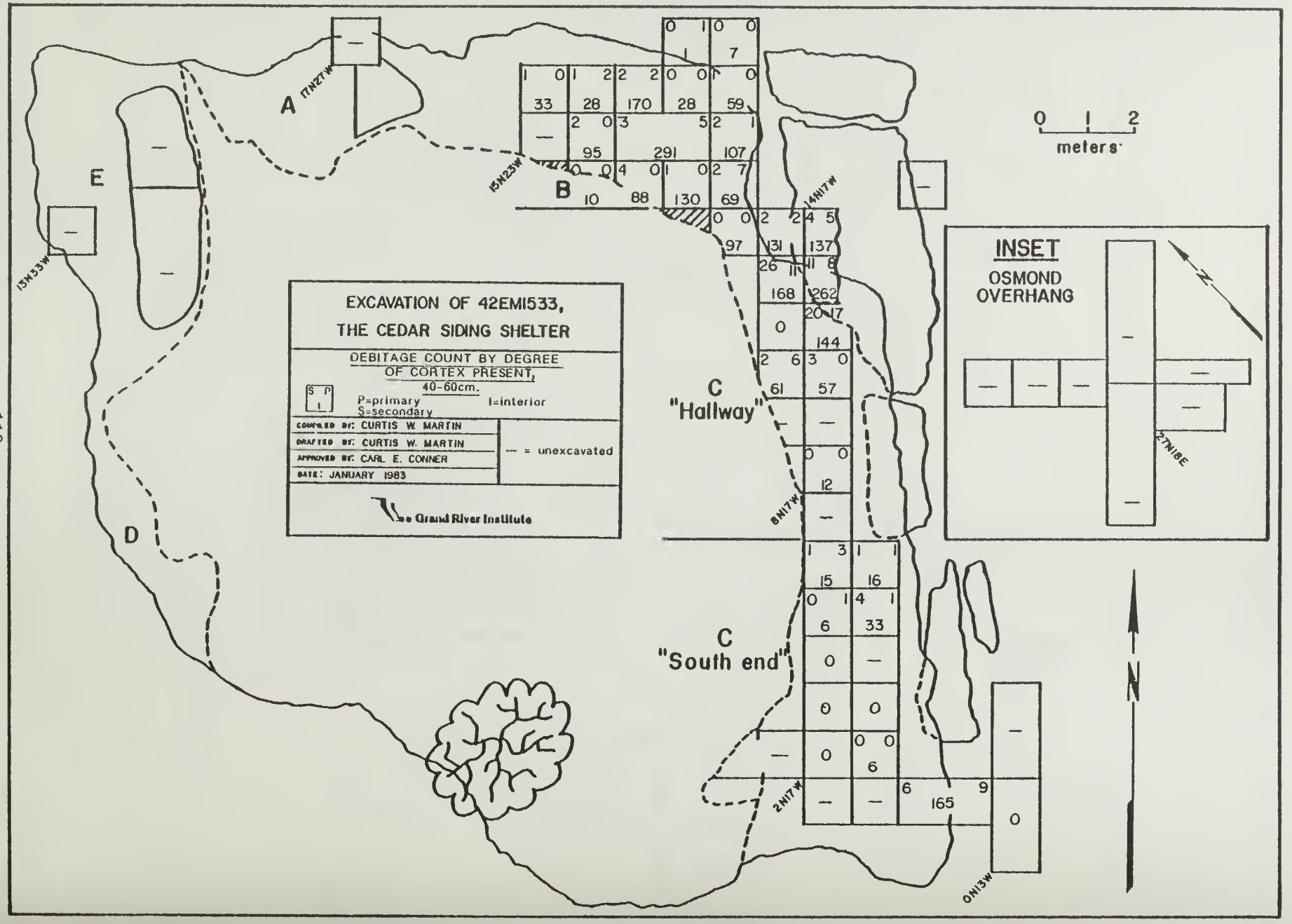


Figure 39. Plan view showing debitage count by degree of cortex present, 40-60cm.

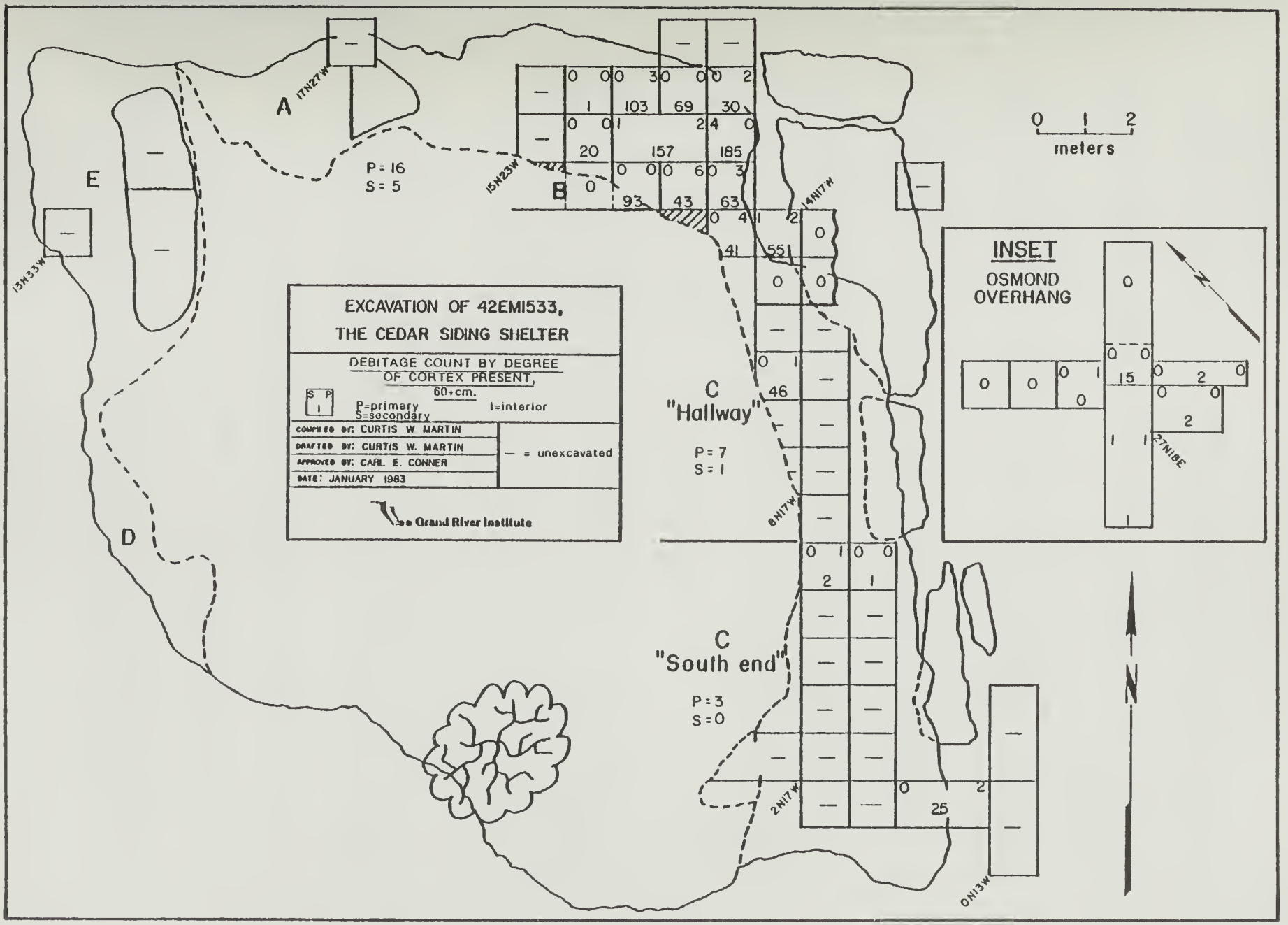


Figure 40. Plan view showing debitage count by degree of cortex present, 60+cm.

Test 10 also indicated a high percentage of cortex present in the 40-60cm level of The Hallway, as compared both to the 0-40cm level and the 60cm and below level.

The number of flakes with cortex occurring in the 3 levels of Overhang B was also compared; however, no statistically significant differences could be demonstrated.

Test 11 compared the percentage of flakes with cortex within the upper 40cm of all 3 proveniences. As expected, the South End of Overhang C once again showed a significantly higher percentage of this artifact type than the shelters to the north.

Test 12, however, demonstrated a higher percentage of cortical flakes in The Hallway than in the South End, within the 40-60cm level. Again, Overhang B produced the smallest percentage.

What these 6 tests combined appear to indicate is that, throughout the various occupations at Cedar Rock, decortication of cores and preliminary shaping activities tended to be carried out in the more southern areas of the shelter and outside of the shelters. In addition, it is obvious that different areas of Overhang C were favored for decortication during different intervals of occupation.

Tests 13 through 17

The final 5 tests conducted which demonstrated notable examples of non-random distribution compared the locations where debitage of chert, quartzite, chalcedony, and "other materials" was recovered. The "other materials" category lumped together specimens of jasper, siltstone, obsidian, mudstone, basalt, and quartz (see Tables 3 and 4 and Figures 41, 42, 43, and 44). Nearly all of the types of chert, quartzite, and chalcedony can be found naturally occurring at a large lithic source area (42EM1534) located several kilometers to the south and southeast of Cedar Siding Shelter.

Test 13 examined the distribution of chert flakes from all levels of the 3 primary excavation proveniences. Although the percentage of flakes in Overhang B that were chert was extremely close to the expected value, the amount in the South End was significantly higher than expected, while in The Hallway it was lower.

Test 14 demonstrated that there were significantly more quartzite flakes in Overhang C, Hallway and less in Overhang B than predicted.

Test 15 showed a predominance of chalcedony in Overhang B and less than expected in the South End.

Tests 16 and 17 both compared specific material categories from the various levels of Overhang B. Respectively, greater than expected numbers of both chalcedony flakes and flakes of "other materials" were found in the 60+cm level, in comparison to either the 0-40cm or the 40-60cm levels.

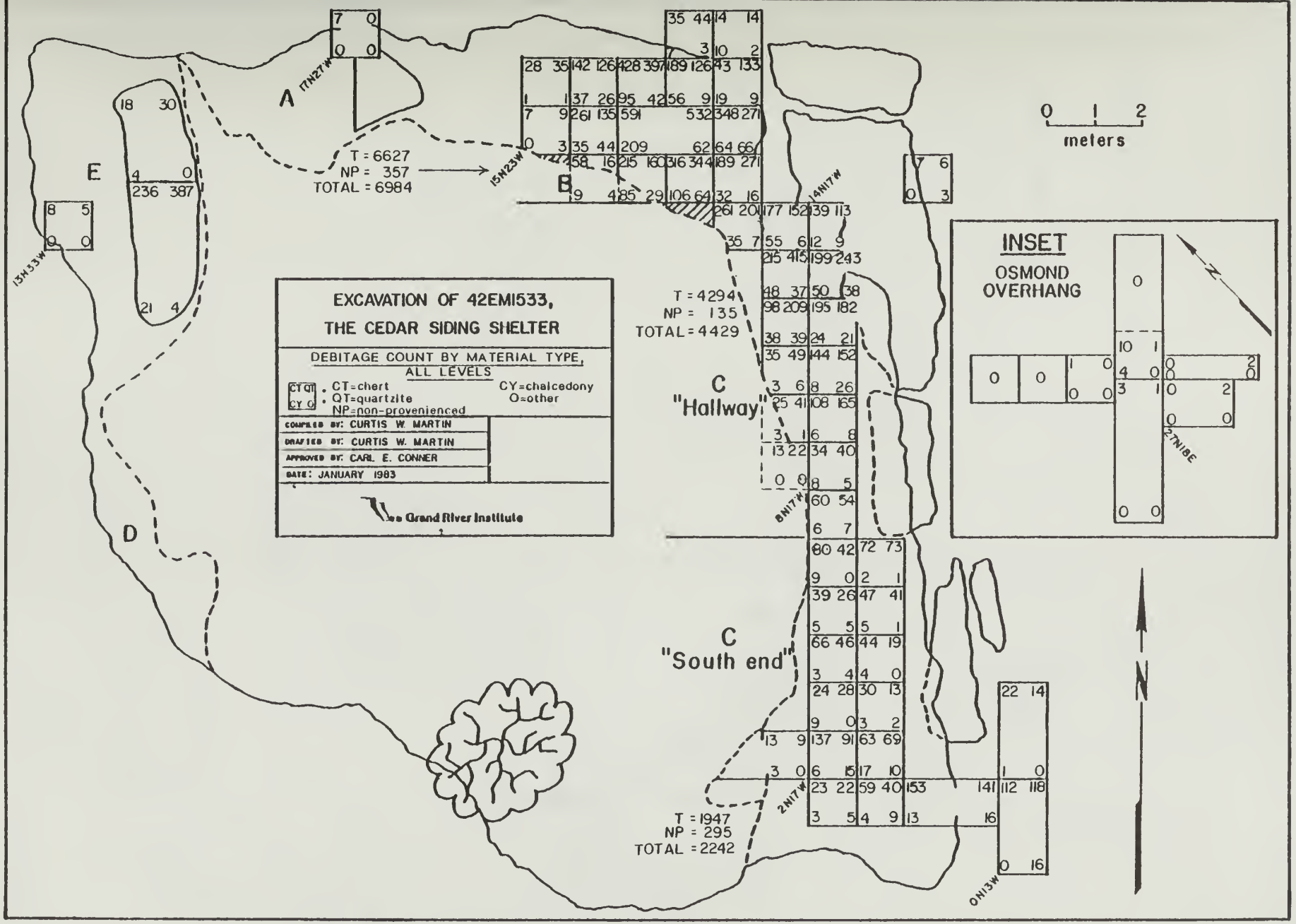


Figure 41. Plan view showing debitage count by material type, all levels.

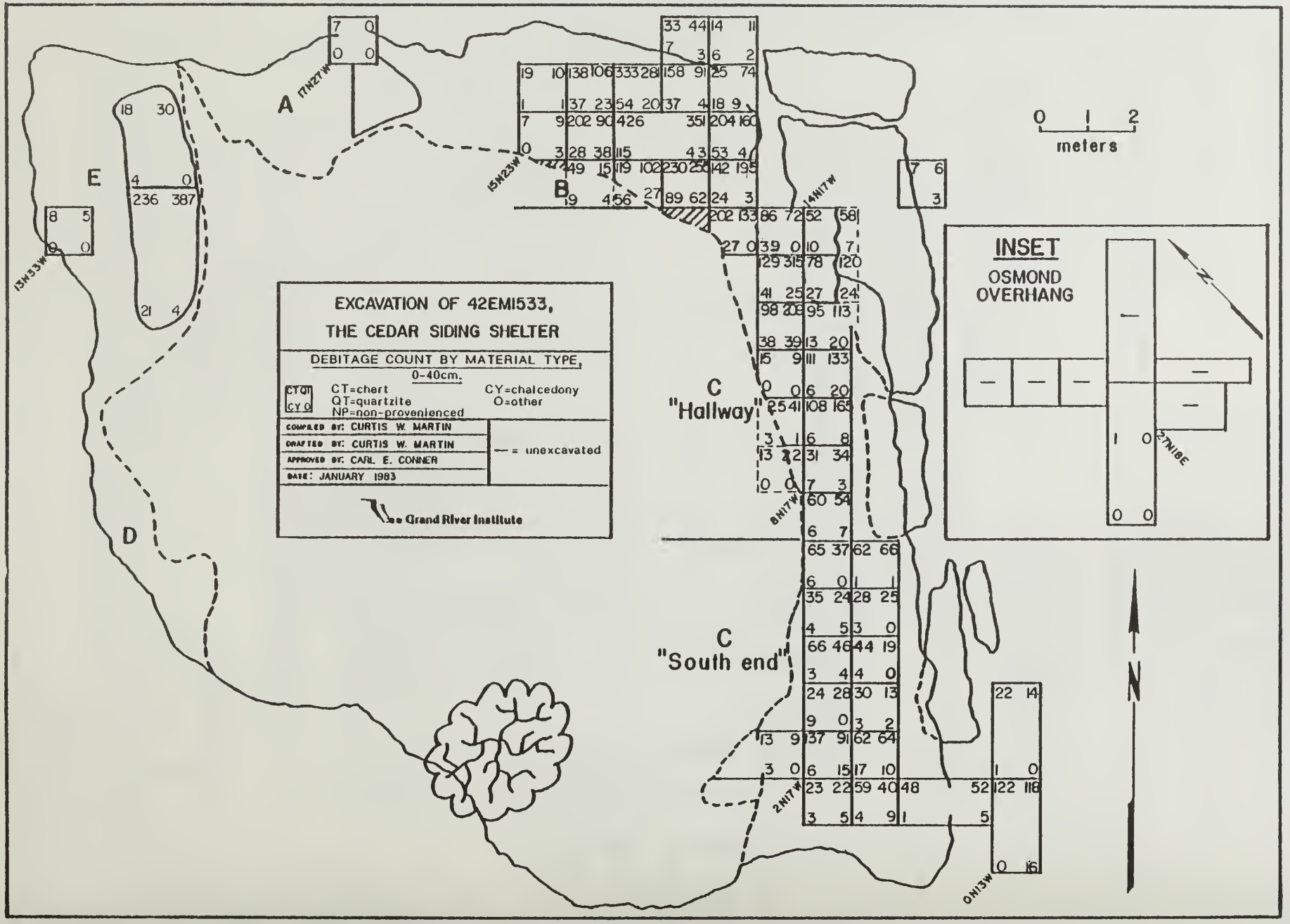


Figure 42. Plan view showing debitage count by material type, 0-40cm.

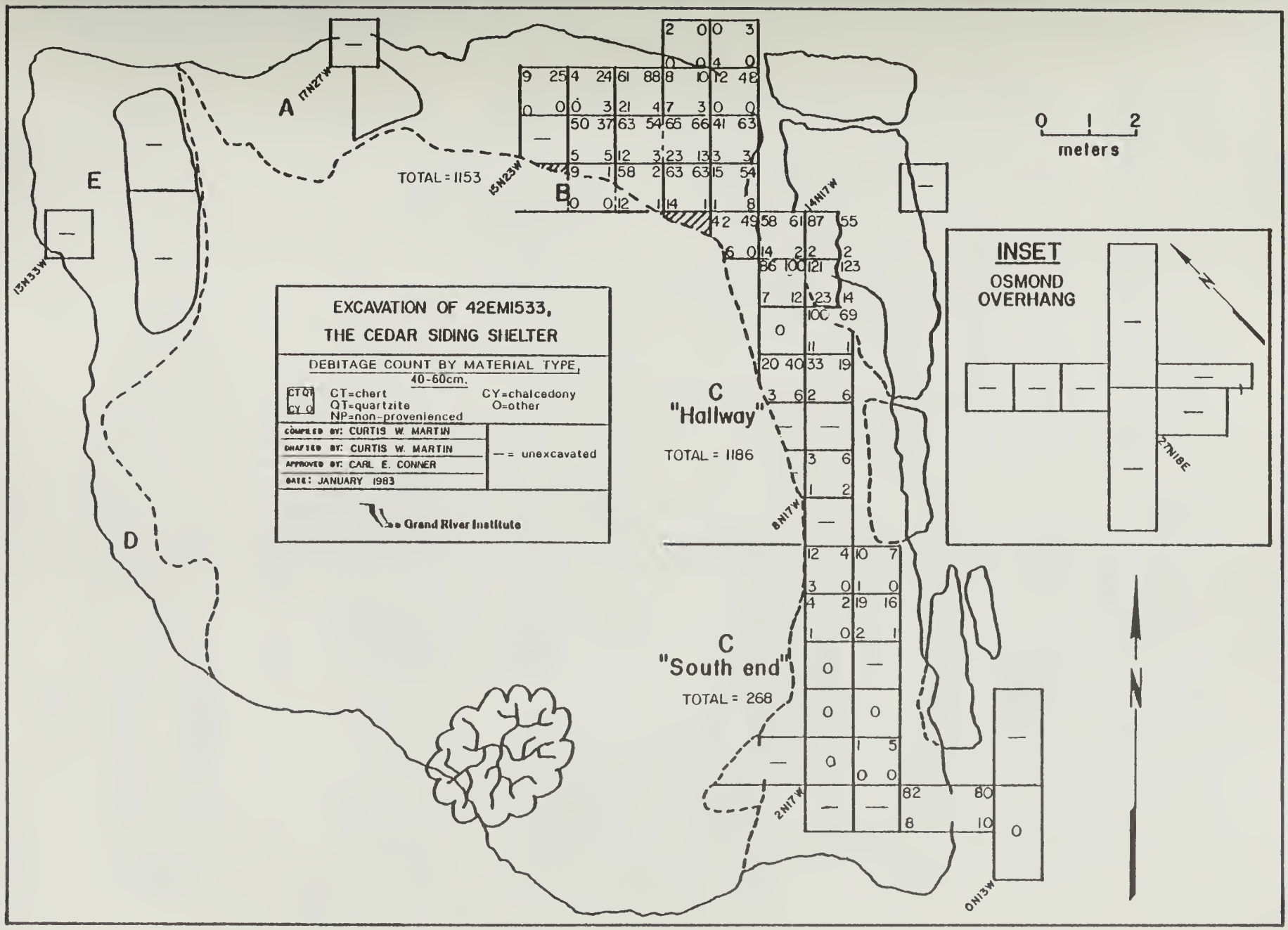


Figure 43. Plan view showing debitage count by material type, 40-60cm.

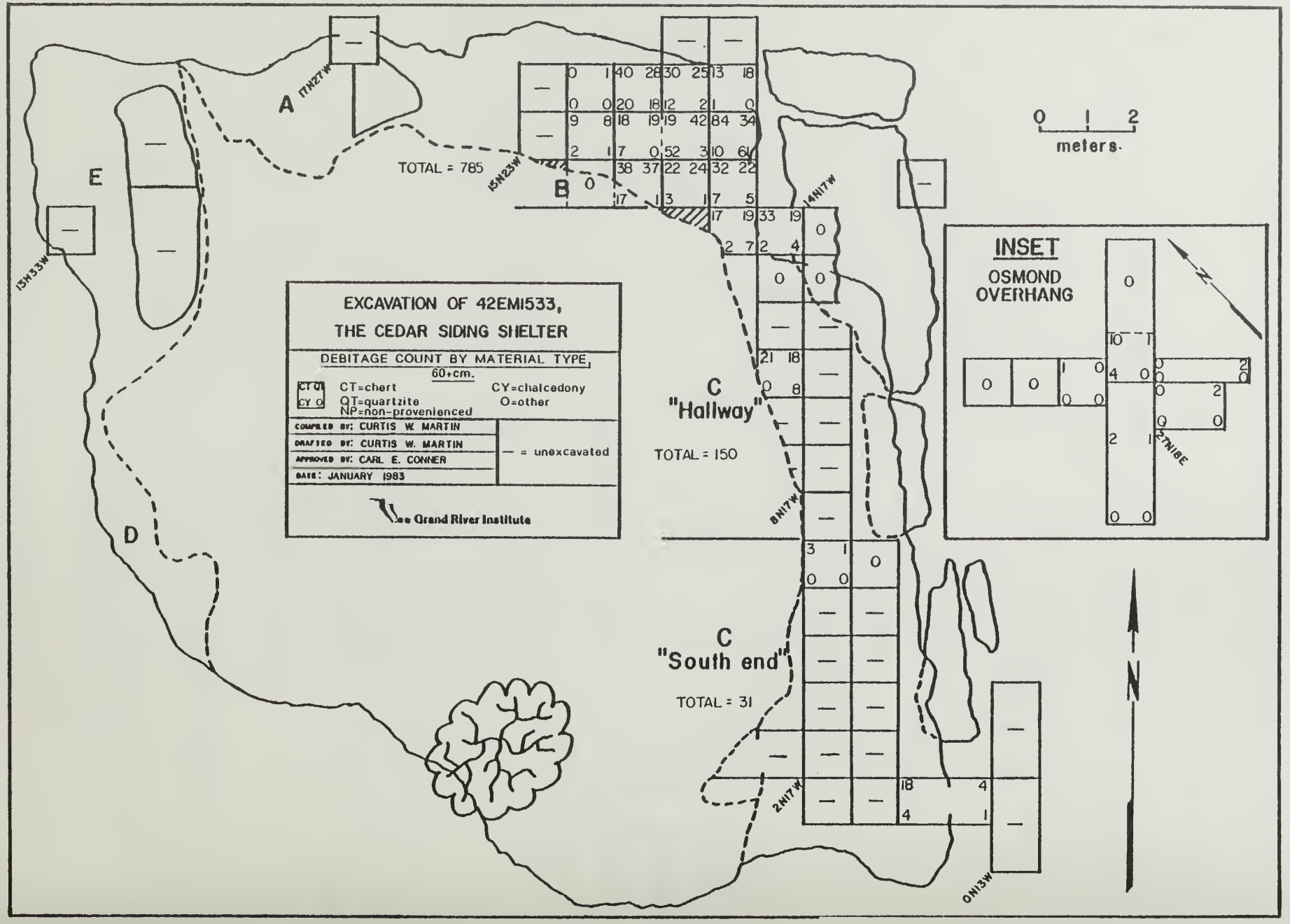


Figure 44. Plan view showing debitage count by material type, 60+cm.

It is difficult to hypothesize on the significance of the above conclusions, other than stating the obvious--that different materials were being used more frequently in different areas (chert in the South End, quartzite in The Hallway, and chalcedony in Overhang B). Also, for reasons undetermined, chalcedony and the "other", rarer materials were used more frequently by the earlier occupants in Overhang B than by later peoples in the same shelter.

A number of the foregoing spatial use patterns appear to have held relatively stable throughout long periods of occupation at the site. Those are the cases where non-random distribution of a trait is evident from one overhang (major provenience) to another, yet not noticeable when viewed level by level within a particular overhang. Tests 1, 2, 7, 8, 13, 14, and 15 fall into this category. Although difficult to positively demonstrate due to the general lack of stratigraphy in the fill, these long-term patterns of use are possibly indicative of a cultural continuity between the Archaic and the Fremont occupations.

Perhaps most significant of these stable patterns is the way in which biface use remained constant throughout the cultural fill (as demonstrated by Tests 1 through 4). For some as yet undetermined reason, the occupants of Cedar Siding Shelter continued to use, dull, resharpen, and break large bifaces in the north-facing shelter (Overhang B), then leave the tips there and transport the bases into the east-facing shelter (The Hallway). Whatever was causing the earlier peoples to select the north overhang for biface use (perhaps shade from the desert heat during meat butchering?) also attracted the later peoples there for similar purposes.

An additional example of apparent cultural continuity at the site can be seen in the similarity of many of the hearth styles throughout the range of dates (particularly the slab-lined units such as Features 7, 11, 23, and 25, which represent a range of dates of from 4100 ± 70 B.P. to 1170 ± 80 B.P.). The two slab-lined cists, Features 10 and 19, are also of a similar style, and suggest constancy in construction of such features between the Archaic and Fremont at Cedar Siding, (if the dates from them can be trusted) (see Feature Description section).

Other distributional tests (3, 4, 9, 10, 11, 12, 16, and 17) demonstrate spatial use patterns which changed through time--showing up in certain levels, but not others. Tests 5 and 6, dealing with the inordinately high amount of wear present on surface flakes, are difficult to interpret temporally, as the cultural materials outside the shelters are quite likely mixed and contain specimens from all of the components at the site.

Activities Represented

The material remains at Cedar Siding Shelter, although abundant, are somewhat limited in terms of overall tool diversity. Core reduction and chipped stone tool manufacture and maintenance were obviously among the major activities taking place both within and outside of the rockshelters. Hunting is indicated by the 10 projectile points and the faunal remains. Activities such as

butchering and wood and bone tool manufacture are implied by the bifaces, unifaces, perforators, choppers, utilized flakes, and so forth.

Wild plant food gathering and processing and/or horticulture is evidenced by the presence of groundstone tools, ceramics, storage cists, and numerous hearths. Apparent economic utilization of pinyon, juniper, barrel cactus, sagebrush, cheno-ams, cattails, arrow root, and several grasses is indicated by the results of pollen (Appendix B) and flotation studies.

Direct evidence of at least an attempt at agriculture is demonstrated by the presence of the 3 corncob fragments in The South End of Overhang C (see Plate 21). All 3 cobs were small, very slender, and completely carbonized. No remains of kernels were present on any, and glumes were partially intact on only one specimen. Wide cupules and row counts of 8 to 10 strongly suggest that these cobs are Maiz de Ocho or a Maiz de Ocho hybrid race such as Pima Papago. The rachis diameter is very slender for North American corn and normally suggests primitiveness; in these specimens, however, it is probably a result of extreme stunting. The lack of other specimens or of corn pollen from the site suggests that it was not a widely grown crop and that these 3 ears are the partial result of a fairly unsuccessful attempt at agriculture (Galinat, personal communication). The cob measurements are as follows:

Rows	Rachis Diameter	Cupule Width	Cupule Depth	Internode Length	Condensation Simple	Condensation Complex	Cupule Shape
10	6.5	6.5	3.0	3.75	2.67	4.40	2.16
8	6.0	5.0	2.0	3.25	2.46	4.31	2.50
8	6.0	6.0	2.0	2.00	2.00	7.00	3.00

Unfortunately, the number of perishable remains recovered was extremely small for overhangs in a dry environment. A pH analysis on several of the soils from the excavation units showed them to be of high pH value (8.4 to 9.0). The corrosiveness of soils of this type may very well be responsible for the paucity of wood, textiles or basketry, faunal remains, and so forth. Basic soils, such as these, can also cause the grinding surfaces on manos and metates to deteriorate quickly and it is likely that many of the sandstone cobbles and slabs which were discarded in the field as "non-artifactual" originally had recognizable ground surfaces.

A wide variety of domestic activities is represented by the cultural remains at the site. It is evident that the entire extended family of a hunting and gathering band could, and most likely did, reside in the shelters. A total of approximately 58 square meters of protected area is present within the dripline of just Overhangs B and C. Cook (1972) estimates that the first 6 individuals in a "household" required 2.32 square meters each (13.92 sq.m.), and that each additional individual required 9.29 sq.m. (his estimates are based on living areas within architectural features). Thus, using this formula, a total of 10 to 11 people could feasibly have "occupied" Overhangs B and C at one time.

Two of the corncobs from Cedar Siding Shelter, Overhang C, South End

PLATE 21

Jennings et al. (1980:56), in estimating the potential population at Sudden Shelter, state that Cook's formula is perhaps too liberal for non-sedentary groups seeking shelter without the aid of formal architecture. Needless to say, additional room was available at Cedar Siding in Overhangs A and E, and within the large Osmond Overhang (which, in all likelihood was occupied numerous times, despite the paucity of remains left in the alluvial deposits there).

That people were occupying the shelter for long periods of time is also evident. Many of the features are well-constructed and complex. The food storage cists imply either extended dependance on their contents (winter occupation?) or anticipated return to the site after extended absence. The evidence of attempted horticulture (corncobs) offers similar proof.

The relatively mild climate of the area (neither the summers nor the winters are unbearably severe), the proximity to permanent water, and, most specifically, the attractiveness of the multi-aspect shelter itself, make Cedar Siding Shelter a perfectly acceptable site for a year-round habitation by its past occupants (the pollen analysis suggests at least late spring through fall occupancy). The multi-aspect nature of Cedar Rock--offering protection from the elements regardless of the direction of the wind (southern exposure when it is cool, northern for when it is hot)--makes it a unique site. Only one other similar "free-standing boulder" could be found in the regional literature--site 42EM1343 near the base of the Book Cliffs to the east of Cedar Siding Shelter (Rauch 1981). Unfortunately, only a single test trench has been excavated at this site, in the south-facing portion of the shelter, making further comparisons impossible.

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Appendix A

Abbreviated Floral and Faunal Lists (Modern)
Cedar Siding Shelter

Abbreviated Floral List (Modern), Cedar Siding Shelter

Trees	
Pinyon Pine	*Pinus edulis*
Juniper	*Juniperus osteosperma*
Cottonwood	*Populus fremontii*
Singleleaf Ash	*Fraxinus anomala*
Shrubs	
Tamarisk	*Tamarix pentandra*
Willow	*Salix amygdaloides*
Saltbush	*Atriplex confertifolia*
	Atriplex natallii
Four-wing Saltbush	*Atriplex canescens*
Greasewood	*Sarcobatus vermiculatus*
Snakeweed	*Gutierrezia sarothrae*
Squawbush	*Rhus trilobata*
Sage	*Artemisia tridentata*
Mormon Tea	*Ephedra torreyana*
Rabbitbrush	*Chrysothamnus nauseosus*
Winter-fat	*Eurotia lanata*
Yucca	*Yucca harrimaniare*
Grasses	
Tall Dropseed	*Sporobolus blepharoneuron tricholepis*
Sand Dropseed	*Sporobolus cryptandrus*
Indian Ricegrass	*Oryzopsis hymenoides*
Galleta	*Hilaria jamesii*
Blue Grama	*Bouteloua gracilis*
Hairy Grama	*Bouteloua hirsuta*
Three-awn	*Aristida longiseta*
Bottlebrush Squirreltail	*Sitanion hystrix*
Cheat grass	*Bromus tectorum*
Salina Wild-rye	*Elymus salinus*
Bluegrass	*Poa sandbergii*
Forbes	
Indian Paintbrush	*Castilleja chromosa*
Prickly Pear Cactus	*Opuntia fragilis*
Mamillaria	*Pediocactus sp.*
Barrel Cactus	*Echinocereus sp.*
Thistle	*Cirsium sp.*
Evening Primrose	*Oenothera caespitosa*
Bladder Pod	*Physaria australis*
Globe Mallow	*Sphaeralcea coccinea*
Pepperweed	*Lepidium montanum*
Desert Trumpet	*Eriogonum inflatum*
Aster	*Aster arenosus*
Locoweed	*Astragalus amphioxus*
Sunflower	*Helianthus annuus*
Sego Lily	*Calochortus nuttallii*
Daisy	*Erigeron utahensis*

Abbreviated Faunal List (Modern), Cedar Siding Shelter

Reptiles	
Western Fence lizard	*Sceloporus occidentalis*
Midget Faded rattlesnake	*Crotalus viridis concolor*
Desert Horned lizard	*Phrynosoma platyrhinos*
Western Whiptail	*Cnemidophorus tigris*
Gopher snake	*Pituophis melanoleucus*
Common Garter snake	*Thamnophis sirtalis*
Mammals	
Desert cottontail	*Sylvilagus auduboni*
White-tailed jackrabbit	*Lepus townsendi*
Least chipmunk	*Eutamias minimus*
White-tailed prairie dog	*Cynomys leucurus*
Northern pocket gopher	*Thomomys talpoides*
Apache pocket mouse	*Perognathus apache*
Ord's kangaroo rat	*Dipodomys ordi*
Western harvest mouse	*Reithrodontomys megalotis*
White-footed mouse	*Peromyscus sp.*
Woodrat	*Neotoma sp.*
Meadow vole	*Microtus sp.*
Porcupine	*Erethizon dorsatum*
Coyote	*Canis latrans*
Bobcat	*Lynx rufus*
Mountain lion	*Felis concolor*
Mule deer	*Odocoileus hemionus*
Pronghorn	*Antilocapra americana*
Bighorn sheep	*Ovis canadensis*

Appendix B

Pollen Analysis, Cedar Siding Shelter

Prepared by

Linda J. Scott

POLLEN ANALYSIS AT CEDAR SIDING SHELTER (42EM1533), EMERY COUNTY, UTAH

By

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Palynological Analysts

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Prepared for

Grand River Institute
Grand Junction, Colorado
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INTRODUCTION

Excavation of a series of overhangs in Emery County, Utah, known as the Cedar Siding Shelter (42EM1533) included pollen sampling. Cedar Siding Shelter is a series of overhangs located around a single, large boulder. The site ranges in age from Middle Archaic to Fremont. Water is currently available from nearby Grassy Trail Creek and an unnamed intermittent drainage. Price River flows approximately 2½ miles to the south of the site. Eleven pollen samples were selected for analysis, and included both a stratigraphic column and feature samples (Table 1). The stratigraphic column was analyzed to assess the paleoenvironment, while the feature samples were analyzed in an effort to define subsistence patterns at the site.

PRESENT ENVIRONMENT

Cedar Siding Shelter is located approximately 7 miles southwest of the Bookcliffs. The vegetation in the immediate vicinity of the site is composed of grasses (Graminae), forbs (Castilleja, Indian paintbrush; Opuntia, prickly pear cactus; Pedicactus, mamillaria; Echinocereus, barrel cactus; Cirsium, thistle; Oenothera, evening primrose; Physaria, bladder pod; Sphaeralcea, globe mallow; Lepidium, pepperweed; Eriogonum, desert trumpet; Astragalus, locoweed; Calochortus, sego lily; various Compositae including Aster, aster; Helianthus, sunflower, and Erigeron, daisy) and shrubs (Sarcobatus, greasewood, Gutierrezia, snakeweed; Rhus, squawbush; Artemisia, sagebrush; Ephedra torreyana, Mormon tea; Chrysothamnus, rabbitbrush; Yucca, yucca; and various Cheno-ams including several Atriplex, saltbush; and Eurotia, winter-fat). A few pinyon (Pinus) are located within a 2 mile radius of the site, and juniper (Juniperus) are scattered. The pinyon-juniper forest begins approximately 3 miles northeast of the site and continues to the Bookcliffs. Riparian communities occur near the site along Grassy Trail Creek and an unnamed intermittent drainage. Elements of these communities include scattered cottonwoods (Populus), willow (Salix), tamarisk (Tamarix), and sedges (Cyperaceae).

METHODS

Pollen was extracted from soil samples submitted from Grand River Institute. A chemical preparation based on flotation was selected for removal of the pollen from the large volume of sand, silt, and clay with which they were mixed.

Hydrochloric acid (10%) was used to remove calcium carbonates present in the soil, after which the samples were screened through 150 micron mesh. Zinc bromide (density 2.0) was used for the flotation process. All samples received a short (5 minute) treatment in hot hydrofluoric acid to remove any remaining inorganic particles. The samples were then acetolated for 3 minutes to remove any extraneous organic matter. Samples that contained large quantities of charcoal or humates were rinsed with hot potassium hydroxide prior

TABLE 1
PROVENIENCE OF POLLEN SAMPLES FROM 42EM1533, CEDAR SIDING SHELTER

Pollen Sample No.	Depth Below PGS	Soil or Strat. Level	Provenience	Pollen Counted
1-17-27	0-7cm		Osmond, B, and C Overhangs	300
26	18cm	Level II	Mano wash, 16N22W, FS 392, Overhang B	100
30	1-8cm	Level I	Overhang C, 12N18W, South wall Radiocarbon dates from similar depths ranged from 1170 to 1980 B.P., Fremont	300
31	13-21cm	Level II	Overhang C, 12N18W, South wall Radiocarbon date 3790 + 130 B.P., Late Archaic	200
32	21-33cm	Level III	Overhang C, 12N18W, South wall Radiocarbon date 2820 + 60 B.P., 3630 + 80 (Level III-IV contact)	Insuff
33	44-55cm	Level IV	Overhang C, 12N18W, South wall Radiocarbon date 3710 + 90 B.P.	Insuff
Fl. 2	38-46cm	Upper fill Feature 7	Slab-lined hearth, Overhang B, Radiocarbon dates averaged to 2775 + 75 B.P.	100
Fl. 3	46-66cm	Lower fill Feature 7	Slab-lined hearth, Overhang B, Radiocarbon dates averaged to 2775 + 75 B.P.	Insuff
Fl. 8	40-50cm	Lower fill Feature 10	Slab-lined storage pit, Overhang C	200
Fl. 29	50-60cm	Upper fill Feature 23	Slab-lined hearth, Radiocarbon date 3740 + 70 B.P., Overhang C	100
Fl. 30	58-69cm	Lower fill Feature 23	Slab-lined hearth, Radiocarbon date 4100 + 70 B.P., Overhang C	Insuff

to floating in zinc bromide. Extensive rinsing with distilled water was required to remove the dissolved humates.

Pollen was identified using a light microscope to count the pollen to an average of 200 grains per sample at a magnification of 430x. Pollen preservation in these samples varied from fair to excellent. Comparative reference material collected at the Intermountain Herbarium at Utah State University and the University of Colorado Herbarium was used to identify the pollen to the family, genus, and species level, where possible.

DISCUSSION

The pollen sample from the present ground surface represents the combination of three samples from the Osmond Overhang approximately 50m southeast of the main boulder, and Overhangs B and C on the northeast and east sides of the boulder respectively. This sample contains a large frequency of arboreal pollen (50%), which is composed primarily of Juniperus pollen (30%), with a smaller quantity of Pinus pollen (20%). It should be noted that a juniper presently grows in a crack on a ledge of the southwestern edge of the boulder. The pollen from this tree is probably more readily transported to the ground surface at the Osmond Overhang than up over the top of the boulder and into the areas designated as Overhangs B and C. Thus, combinations of samples from the present ground surface of these three areas results in an elevated Juniperus frequency as a result of the greater Juniperus pollen deposition at the Osmond Overhang. The largest non-arboreal component of this pollen sample is the Cheno-am pollen at 12%, followed closely by 10% Artemisia pollen (Figure 1, Table 2). Graminae also contributes a significant portion (8%) to the pollen record, as does low-spine Compositae (7%). If one takes into account the over-representation of Juniperus, this sample may be used as a control for interpretation of the prehistoric stratigraphic samples from Overhang C. Comparison of this sample and the sub-surface samples from Overhangs B and C shows that the paleoenvironment in the area of this site has contained the same elements for the period represented (approximately 3790 B.P. to present). Pollen Sample 30, taken at a depth of 1-8cm below the present ground surface contains primarily modern pollen that shows no signs of deterioration. The Juniperus frequency in this sample is considerably lower than that for the composite surface sample. This is probably the result of the distribution pattern (discussed above) of pollen from the juniper tree located on the southwest edge of the boulder. The presence of primarily modern pollen in this sample indicates that it, too, may be used as a control sample, indicative of the modern environment in the vicinity of the site. Sample 30 displays a higher frequency of Pinus pollen (34%) than the composite surface sample (1-17-27). In addition, the quantity of Artemisia pollen (18%) is slightly higher than that in the composite surface sample. Sample 31 represents Level II, which has been radiocarbon dated to 3790 + 130 B.P. The pollen record in this sample is essentially the same as that in Sample 30, with the exception that it contains more Cheno-am pollen and less Juniperus (10%) and Artemisia (13%) pollen. The Artemisia frequency falls between that of the composite surface sample (10%) and Sample 30, also containing pollen from the modern environment (18%), and

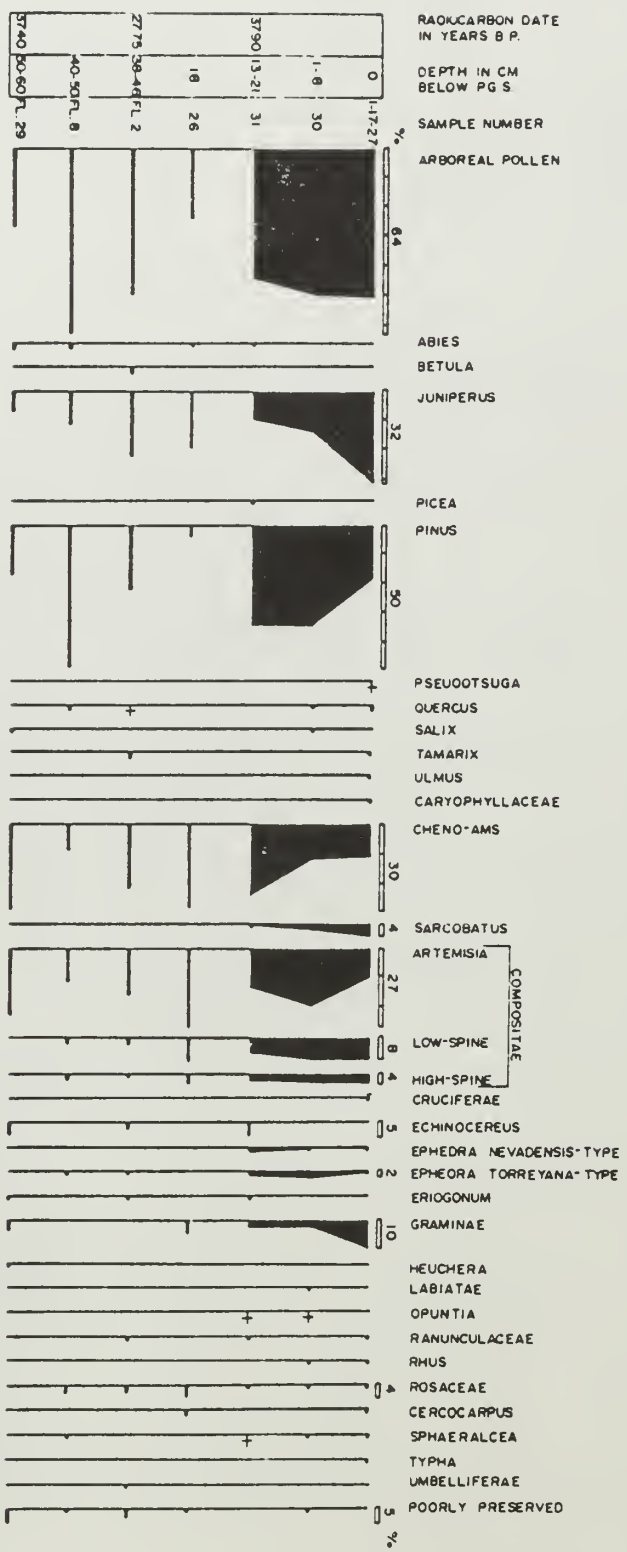

FIGURE 1. POLLEN DIAGRAM FROM 42EM1533.

TABLE 2
POLLEN TYPES OBSERVED AT 42EM1533

Scientific Name	Common Name
ARBOREAL POLLEN	
Abies	Fir
Betula	Birch
Juniperus	Juniper
Picea	Spruce
Pinus	Pine
Pseudotsuga	Douglas fir
Quercus	Oak
Salix	Willow
Tamarix	Tamarisk
Ulmus	Elm
NON-ARBOREAL POLLEN	
Caryophyllaceae	Pink family
Cheno-ams	Goosefoot family and pigweed
Sarcobatus	Greasewood
Compositae	Sunflower family
Artemisia	Sagebrush
Low-spine	Includes ragweed, sand-bur, etc.
High-spine	Includes Aster, Helianthus, Erigeron, etc.
Cruciferae	Mustard family
Echinocereus-type	Barrel cactus, may include Pediocactus (mammillaria)
Ephedra	Mormon tea
Eriogonum	Buckwheat
Graminae	Grass family
Heuchera	Arrow root
Labiatae	Mint family
Opuntia	Prickly pear cactus
Ranunculaceae	Buttercup family
Rhus	Squawbush
Rosaceae	Rose family
Cercocarpus-type	Mountain mahogany
Sphaeralcea	Globe mallow
Typha	Cattail
Umbelliferae	Carrot or parsley family

is therefore, not indicative of environmental change. The increase in Cheno-am pollen, as well as the presence of Echinocereus-type pollen and Eriogonum pollen may be related to cultural activity and utilization of these plants at the site.

Features

The features sampled include slab-lined hearths and a slab-lined storage pit. In addition, a mano was washed for pollen. The mano wash yielded very little arboreal pollen, but higher quantities of Cheno-am, and particularly Artemisia pollen. The elevated Cheno-am (28%) and Artemisia (27%) pollen frequencies may be associated with the preparation of food. Cheno-am seeds are frequently ground into meal (Stevenson 1915; Robbins et al. 1916; Whiting 1939; Vestal 1952; Bye 1972) by a variety of Indian groups. The Zuni are noted to grind Artemisia seeds, which were then mixed with water and made into balls or pats, and steamed (Stevenson 1915). The Zunis declare that this was among their most ancient foods. Artemisia is also frequently noted to have been used medicinally by a variety of aboriginal groups (Stevenson 1915; Robbins et al. 1916; Whiting 1939; Vestal 1952; Bye 1972).

Feature 7, a slab-lined hearth which produced an average radiocarbon date of 2775 B.P. + 75 yielded pollen in the upper fill. This sample is very much like the stratigraphic samples from Overhang C in pollen content. The Echinocereus pollen, however, may reflect utilization of this type of cactus. Echinocereus pollen occurs only in slab-lined hearths and Sample 31 from a cultural fill within Overhang C. Echinocereus is considered a food by numerous Indian groups (Whiting 1939; Vestal 1952; Bye 1972), who eat the fruit.

Feature 10, a slab-lined storage pit, yielded pollen in the undifferentiated fill. No radiocarbon date can be assigned to this feature, which exhibits a very large frequency of Pinus pollen (48%). This may reflect the storage of pinyon nuts in the feature. Pinus is 14 percentage points more abundant in this sample than in the sample displaying the next largest frequency.

Feature 23, a slab-lined hearth which produced dates of 4100 B.P. + 70 in the lowest level and 3740 + 70 in the upper level, yielded pollen only in the upper level. The pollen in this sample is very similar to that in the stratigraphic pollen record. This sample does, however, contain 4% Echinocereus-type pollen as does Feature 7, also a slab-lined hearth.

Members of the Chenopodiaceae family (such as Atriplex and Chenopodium) and Amaranthus are noted to have been utilized as food and medicine in several ethnobotanical studies. The Paiute Indians were noted to have used the seeds of all three of these plants as food (Bye 1972). Vestal (1952) reported several instances of the use of these plants as medicines. The Pueblo Indians also utilized the seeds of these plants quite heavily as food (Stevenson 1915; Whiting 1939). In addition, the leaves of Chenopodium and Amaranthus were also boiled as greens (Robbins et al. 1916; Whiting 1939). It is possible that the increased Cheno-am frequencies in the slab-lined hearths, in the mano wash, and in the cultural fill may result from the utilization of Cheno-am seeds

and/or greens at the site. The increased Artemisia frequencies in the mano wash sample and one slab-lined hearth are also suggestive of the utilization of Artemisia at the site, possibly by grinding the seeds into a meal. Echinocereus pollen occurs only in the slab-lined hearths and the cultural fill sample (31), and has also been interpreted to indicate utilization of that plant, probably as a fruit, although it is possible that the flower buds were picked and roasted, much as cholla cactus buds are (Greenhouse et al. 1981).

SUMMARY AND CONCLUSIONS

The pollen record from 42EM1533, Cedar Siding Shelter, reflects an environment similar to that of today for the periods sampled. The area around the site appears to have supported a mixture of grasses, shrubs, and forbs, much as it does today, with saltbush (a Cheno-am) and sagebrush (Artemisia) important elements of the vegetation. Evidence of scattered Pinus and Juniperus, and a nearby pinyon/juniper community are present throughout the pollen record. The absence of pollen from the lower stratigraphic levels, and the apparent slow accumulation of fill or absence of later fill in the upper portion of Overhang C precludes the possibility of reconstructing paleoenvironmental change through time at this site.

Analysis of feature samples from Cedar Siding Shelter has resulted in the identification of the possibility that pinyon nuts were stored in the slab-lined storage pit designated Feature 10. In addition, Echinocereus pollen was noted from two slab-lined hearths and the cultural fill of Overhang C, which may indicate its use by the occupants of this site. The fruit or flower buds are the most probable portions of the barrel cactus to have been used. Cheno-am frequencies were higher on the mano wash (Sample 26), in the two slab-lined hearths (Samples Fl. 2 and Fl. 29) and in Sample 31 representing cultural fill within Overhang C than in the upper stratigraphic level and present ground surface sample, and the sample from the slab-lined storage pit. This may indicate immediate utilization of this resource, rather than longer term storage of the seeds. Only Pinus pollen was observed in a sufficiently large frequency in the slab-lined storage pit to suggest storage of this item in the pit. The only evidence of possible utilization of Artemisia at this site comes from the mano wash and one slab-lined hearth, which exhibit higher than average frequencies of this pollen type. Higher frequencies of Rosaceae pollen were noted in the mano wash, one slab-lined hearth, and the slab-lined storage pit, indicating the possibility of use of a member of the rose family. Graminae pollen does not occur in large frequencies in the features and mano wash, but it should not be ruled out as a possible element of the diet.

Pollen evidence of utilization of several elements of the local environment is consistent with an Archaic subsistence pattern. Similar evidence of utilization of diverse plant resources is noted in other pollen studies from this general area with Archaic components. At Cowboy Cave (8275-1890 B.P.) high frequencies of Cheno-am pollen and increased quantities of Compositae pollen were noted in cultural samples (Lindsay 1980) and interpreted to relate to subsistence. The pollen record at Sudden Shelter (7000-3300 B.P.) indicates

utilization of various native plants including Juniperus, Quercus, Pinus, Cheno-ams, Graminae, Compositae, Ephedra, and possibly Artemisia, Cactaceae, and Rosaceae, among others (Lindsay 1980). The pollen record at Sudden Shelter is indicative of stability in the Archaic subsistence pattern for that site over a long period of time. The pollen record at 42EM959 and 42EM960 (Scott 1980), two overhang sites in northwestern Emery County with both Archaic and Fremont components, displays higher than average frequencies of Cheno-am pollen in a hearth and an undisturbed cultural stratum in a midden, indicating the probability that Cheno-ams were utilized at those sites.

At Cedar Siding Shelter the utilization of Pinus (probably pinon nuts), Cheno-ams (probably the seeds were ground), Echinocereus (fruits or possibly flower buds), Artemisia (seeds possibly ground), and possibly members of the Rosaceae and even Graminae (seeds possibly ground) are suggested in the pollen record. This diversity in utilization of the local plant resources appears to be typical of Archaic subsistence patterns. Utilization of this compliment of floral resources suggests a summer and fall occupation of the site. The seeds and fruits of these plants mature and are ready for collection during that period of time. Utilization of Echinocereus buds may occur during the late spring and summer, as Echinocereus and Pediocactus (mamillaria) are noted to bloom from April to August, depending on species. The diversity in utilization of local plant resources evidenced in the pollen record at this site appears to be typical of Archaic subsistence patterns. It adds to and supports the body of subsistence data noted in pollen records at other sites from this general area displaying Archaic components.

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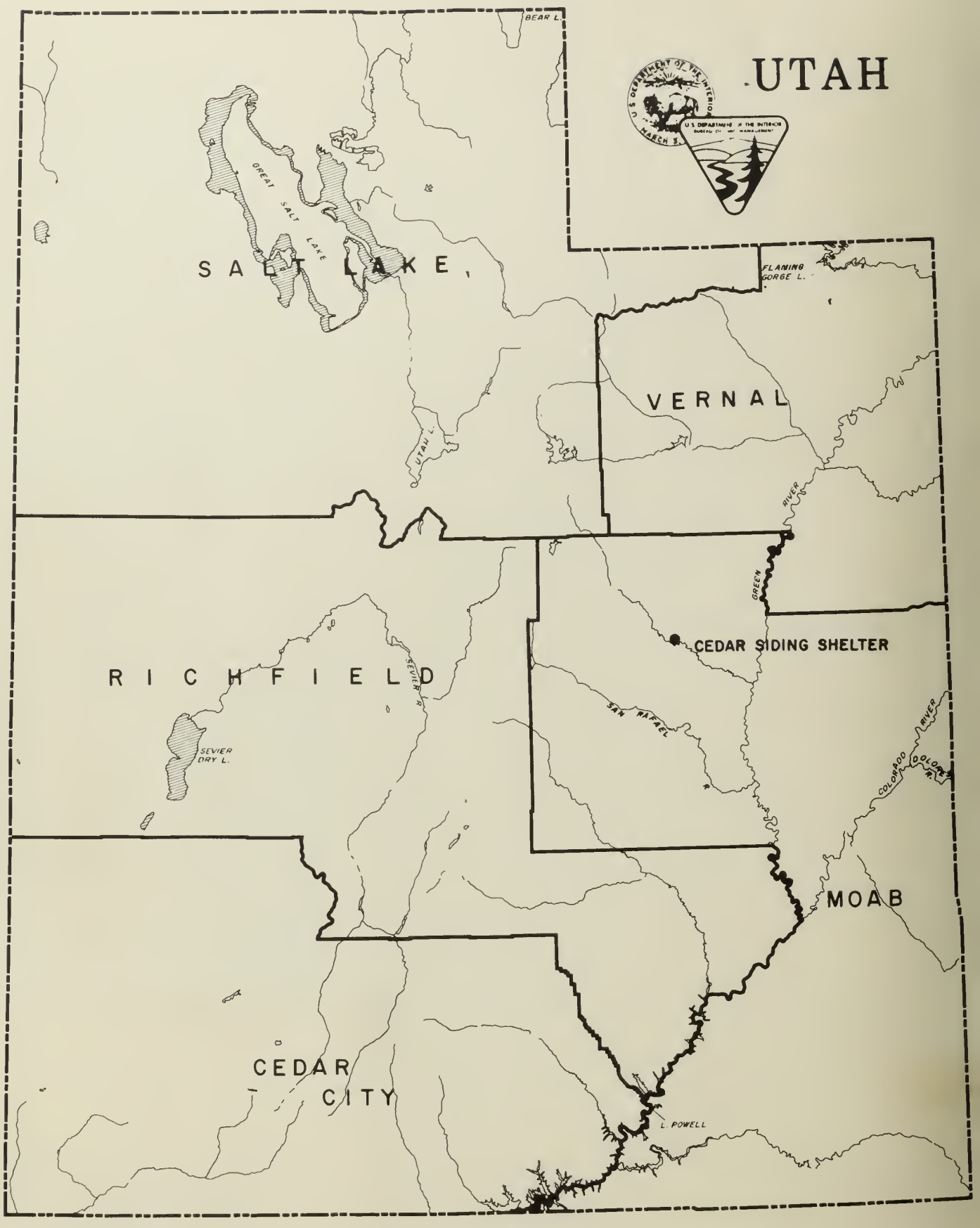
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